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Forest Service

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Final Environmental Impact Statement

For the Revised Land Management Plan

Idaho Panhandle National Forests

Cover Photo: Orville Mountain

Land Management Plan
Final Environmental Impact Statement
Boundary, Bonner, Kootenai, Benewah, and Shoshone Counties in Idaho
Lincoln and Sanders Counties in Montana
Pend Oreille County, Washington

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Abstract: This final environmental impact statement (FEIS) documents analysis of four alternatives developed for programmatic management of the 2.5 million acres administered by the Idaho Panhandle National Forests. The Forest Service has identified Alternative B Modified as the preferred alternative.

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Acronyms

AMS	Analysis of the Management Situation
ASQ	Allowable Sale Quantity
ATV	All-terrain vehicle
AUMs	Animal Unit Months
BLM	Bureau of Land Management
BMPs	Best Management Practices
BMUs	Bear Management Units
CER	Comprehensive Evaluation Report
CFR	Code of Federal Regulations
CYRZ	Cabinet Yaak Grizzly Bear Recovery Zone
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FIA	Forest Inventory and Analysis
FSEIS	Final Supplemental Environmental Impact Statement
GA	Geographic Area
GIS	Geographic Information System
HRV	Historic Range of Variability
ICBEMP	Interior Columbia Basin Ecosystem Management Project
ID DEQ	Idaho Department of Environmental Quality
IDT	Interdisciplinary Team
INFISH	Inland Native Fish Strategy
IPNF	Idaho Panhandle National Forest
IRAs	Inventoried Roadless Areas
KIPZ	Kootenai Idaho Panhandle Zone
KNF	Kootenai National Forest
LMP	Land Management Plan
LTSYC	Long-term Sustained Yield Capacity
MA	Management Area
MCF	Thousand Cubic Feet
MIS	Management Indicator Species
MMBF	Million Board Feet
MMCF	Million Cubic Feet
MOU	Memorandum of Understanding
MVUMs	Motor Vehicle Use Maps
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NHPA	National Historic Preservation Act
NFS	National Forest System
NOI	Notice of Intent
NRLMD	Northern Rockies Lynx Management Direction
RHCAs	Riparian Habitat Conservation Area
RNAs	Research Natural Areas
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
SRZ	Selkirk Grizzly Bear Recovery Zone
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFS	United States Forest Service
USFWS	US Fish & Wildlife Service
WSA	Wilderness Study Area
WUI	Wildland Urban Interface

Summary

Proposed Action

The Idaho Panhandle National Forests (IPNF) proposes to revise its Land and Resource Management Plan. The area affected by the proposal includes about 2.5 million acres of public land. The revised Forest Plan would designate seven management area (MAs) themes across the Forest: Wilderness (Designated, Recommended, Wilderness Study Area, and Primitive); Designated and Eligible Wild and Scenic Rivers; Special Areas (botanical, geological, historical, recreational, scenic, or zoological); Research Natural Areas (RNAs) (established and recommended) and Experimental Forests; Backcountry; General Forest; and Primary Recreation Areas. The proposed MAs span a continuum (figure 1) that includes, at one end, an approach emphasizing passive management and natural restoration with little human-caused change, and on the other end, more active management with substantially more human-caused change designed to sustain the social, economic, and ecological attributes of the Forest.

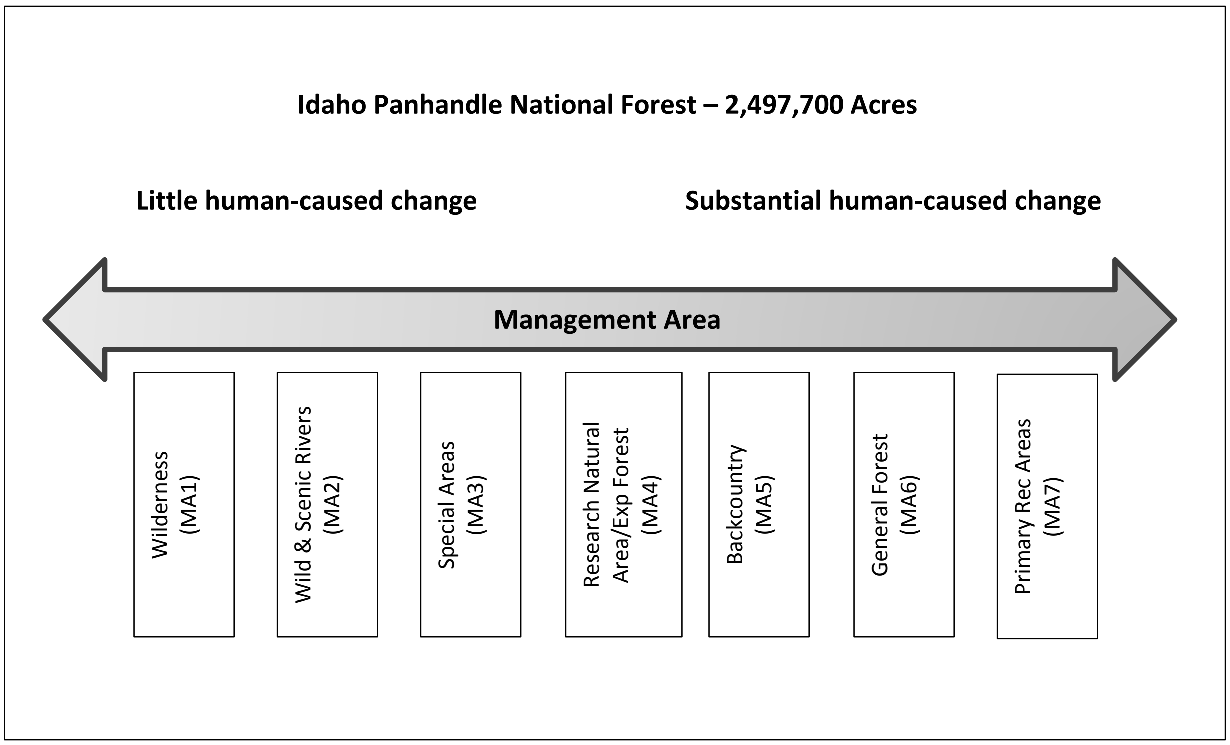


Figure 1. Management Area Continuum on the IPNF

Allocation to a specific MA does not mandate or direct the Forest Service to propose or implement any action; rather, the MAs provide direction on desired conditions and allowable activities and uses, including the following:

- Timber harvest/timber production;
- Commercial and personal use of special forest products and firewood;
- Fire (prescribed and natural, unplanned);
- Livestock grazing;
- Motor vehicle use;

- Over-snow vehicle use;
- Mechanized use;
- Road construction and reconstruction; and
- Minerals (leasable and minerals material).

Purpose and Need

The purpose of the action is to revise the 1987 Forest Plan for the IPNF. The final Forest Plan would guide natural resource management activities on the Forest, address changed conditions and direction that have occurred since the original Plan (1987), while meeting the objectives of federal law, regulation, and policy. Specifically, the final Forest Plan would provide management direction for identified revision topics forestwide, as well as MA direction.

In late 2000, the forest supervisor determined that revision was needed because significant changes had occurred in conditions and demands. The need for revision or change is based on legal requirements, changed conditions, and the Analysis of the Management Situation (AMS) (2003). Revision is also warranted because the Plan is beyond the 10 to 15 year duration provided by the National Forest Management Act (NFMA) (16 United States Code (U.S.C.) 1606(e) (5) (A)).

Public Involvement

In late 2000, the IPNF began working on revision of the Forest Plan under the 2000 Planning Rule. In April 2002, the Forest published a notice of intent (NOI) in the *Federal Register* announcing the revision of the Land Management Plan (LMP) with a 12-month public comment period.

From April 2002 to May 2004, the IPNF hosted public meetings, open houses, field trips, and workgroup meetings. Approximately 19 informational and comment meetings took place in and around the local communities during the scoping process, which started in April 2002, with the NOI in the *Federal Register* and ended in May 2004. In addition to the public meetings; briefings and meetings were held with the Tribes, Congressional representatives, other elected officials, other agencies, and interest groups.

In addition, the IPNF hosted approximately 90 workgroup meetings from August 2003 to September 2005. These meetings were held in the communities within the IPNF and the workgroups focused on the geographic areas (GAs) surrounding each of these communities. The purpose of these workgroup meetings was to: 1) share information about the revision topics; 2) collaboratively discuss and develop desired conditions for each of the revision topics within the workgroup's GAs; 3) gain an understanding of the issues and appreciation of others' viewpoints; and 4) discuss Starting Option maps and potential changes to suggest to the forest supervisor.

On May12, 2006, the Forest released the draft Proposed Land Management Plan under the 2005 Planning Rule. Open houses and public meetings were held to share the Proposed Land Management Plan, Comprehensive Evaluation Report, and other documents for the 120-day public comment period. Public comments on the proposed Plan were analyzed and summarized in a report (the Analysis of Public Comment Report, March 2007). Based on public and agency comments, the revision team began development of the final Plan. A court injunction (March 30, 2007) resulted in suspension of Forest Plan revision activities under the 2005 Planning Rule. The 2008 Planning Rule was released in April of 2008 and Forest Plan revision resumed under that Rule. A final Plan release was anticipated for winter of 2009 when a court ruling invalidated the 2008 Planning Rule in June 2009. The 2000 Planning Rule was reinstated in December of 2009. The 2000 Planning Rule was amended in 2002 to allow the Forest Service to follow the procedures of the 1982 Planning Rule. The Forest issued a second NOI in March

2010 to revise the Forest Plan using the 1982 procedures under the 2000 Planning Rule. All the public comment received on the various plan revision products over the life of the Plan revision were used in developing the draft Forest Plan and draft environmental impact statement (DEIS).

The draft Forest Plan and DEIS were released for public comment in January of 2012. Open houses were held in the communities throughout the Forest in January and February to share information regarding the documents and the process for commenting. The initial 90-day comment period for the draft EIS was extended an additional 30 days through May 7 of 2012. Numerous meetings were held with interested publics and elected officials during the 120 day comment period. Comments received during this 120-day comment period have been responded to in appendix G of the final EIS.

Major Issues

The major issues are the seven primary revision topics addressed by the revised Forest Plan. These topics represent areas where there are unresolved conflicts concerning alternative uses of available resources.

- Vegetation
- Fire
- Watershed and Aquatic Species
- Terrestrial Wildlife
- Access and Recreation
- Recommended Wilderness
- Timber Production

Alternatives

These major issues led the agency to develop four alternatives:

Alternative A is the no-action alternative. This alternative is the 1987 Forest Plan, as amended to date, and accounts for current laws and regulations. New information, inventories, and technologies were used to evaluate this alternative. Output levels were recalculated for this alternative based on these new sources of information and amended direction. The no-action alternative retains the 1987 Forest Plan goals and objectives, standards and guidelines, and MA prescriptions, as amended. This alternative serves as the baseline for comparison with the action alternatives.

Alternative B Modified is based on Alternative B from the DEIS, with modifications in response to comments. This alternative is the revised Forest Plan. It is the result of collaborative efforts since 2003 and responds to the identified purpose and need. This alternative emphasizes moving towards desired future conditions and contributing to ecological, social, and economic sustainability. Alternative B Modified would manage approximately 5 percent of the Forest as recommended wilderness (MA1b), 27 percent as backcountry (MA5), and 60 percent as general forest (MA6). Thirty-eight percent of the Forest would be suitable for timber production.

Alternative C emphasizes wilderness values and protection of backcountry while moving towards desired conditions. There is an increased emphasis on natural disturbance processes (such as unplanned wildfire ignitions for multiple objectives) and prescribed burning. Mechanical treatments (e.g., timber harvest, stream improvements) also occur in order to move towards watershed and vegetation desired conditions. Alternative C would have more opportunities for backcountry and non-motorized recreation (MA1 – 335,300 acres; MA5 – 630,000 acres). This alternative also has more acres recommended as wilderness (331,100 acres) than any other alternative. About 57 percent would be allocated to general forest (MA6). Thirty-six percent of the Forest would be suitable for timber production.

Alternative D emphasizes achieving desired condition through mechanical means. Timber production is emphasized while moving towards vegetation desired conditions. This alternative has the most acres available for timber production and motorized access with 63 percent allocated to MA6 (general forest). There would be less recommended wilderness (138,100 acres or about 5 percent) and backcountry (MA5 – less than 13 percent of the Forest). Thirty-nine percent of the Forest would be suitable for timber production.

All alternatives in this document adhere to multiple use and sustained yield of goods and services (Code of Federal Regulations (CFR) (36 CFR 219.1(a), (b)). In addition, they share objectives and standards for managing forest resources and complying with applicable laws and policies. They also contain the same direction to contribute to the diversity of desired native and non-native plant and animal communities and contribute toward the recovery of threatened and endangered species. Forestwide direction identified in the Plan would apply to all action alternatives. The difference between alternatives is primarily the difference in allocation of acres by MA to meet the purpose and need for change, and address one or more of the major issues.

Each alternative was developed to be in compliance with applicable law and regulation, as well as national policy and direction including, but not limited to, the Healthy Forests Initiative, National Fire Plan, and National Energy Policy. Each alternative retains the following existing decisions to the 1987 Forest Plan and the associated Biological Opinion:

- Inland Native Fish Strategy (INFISH) (Decision Notice and Finding of No Significant Impact (1995));
- Northern Rockies Lynx Management Direction (Record of Decision (ROD)) (USDA Forest Service 2007 March); and
- Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones (USDA Forest Service 2011b and 2011c).

The following would not change between alternatives.

- **Draft Forest Plan Goals, Desired Conditions, and Standards and Guidelines –** Management area and forestwide direction for goals, desired conditions, standards, and guidelines remains constant for all action alternatives.
- **Experimental Forests –** Allocation of Experimental Forests (MA4b) remain constant for all action alternatives.
- **Developed Recreation Sites –** Existing developed recreation sites are retained in all alternatives. Alternatives do not make decisions to remove or to create developed recreation sites. Allocation of primary recreation areas (MA7) remains constant for all action alternatives.
- **Utility Rights-of-Way and Communication Sites –** Direction for and location of designated utility rights-of-way and communication sites remains constant for all alternatives.
- **Wild and Scenic Rivers –** Direction for and allocation of designated and eligible wild and scenic rivers (MA2a and MA2b) remains constant for all action alternatives.
- **Wilderness Study Area –**The Grandmother Mountain Wilderness Study Area and its management would continue as outlined by the Arkansas-Idaho Land Exchange Act (1992) and the Idaho Land Enhancement Act (2006), regardless of which alternative is selected for implementation.

- **Designated Wilderness –** The Salmo-Priest Wilderness Designation remains constant for all alternatives.

Comparison of Alternatives

Chapter 3 of this FEIS presents a detailed description of the effects of the alternatives. The following tables provide a summary of management area allocations by alternative (table 1) and effects by revision topic (table 2).

Table 1. Comparisons Percent MA Allocation by Alternative

MA	Alternative A[1]	Alternative B Modified	Alternative C	Alternative D
MA1a – Designated Wilderness	6.2%[2]	0.4%	0.4%	0.4%
MA1b – Recommended Wilderness[5]	[2]	6.1%	12.8%	5.2%
MA1c – Wilderness Study Area	n/a	0.3%	0.3%	0.3%
MA1e – Primitive Lands		0.8%	0%	0.4%
MA2a – Designated Wild & Scenic Rivers	1.2%[3]	0.9%	0.9%	0.9%
MA2b – Eligible Wild & Scenic Rivers		2.0%	1.7%	1.9%
MA3 – Special Areas	0.3%	0.5%	0.5%	1.4%
MA4a – Research Natural Areas	0.7%[4]	0.6%	0.6%	0.6%
MA4b – Experimental Forests		0.3%	0.3%	0.3%
MA5 – Backcountry	n/a	27.3%	25.2%	25.0%
MA6 – General Forest	n/a	60.3%	56.9%	63.1%
MA7 – Primary Recreation Area	n/a	0.5%	0.5%	0.5%

[1] Alternative A, the no-action alternative, is included even though it does not use the management areas shown in the revised Forest Plan. See table 4 in chapter 2 for a crosswalk of the 1987 Plan management areas to those used in the revised Plan and the action alternatives.

[2] Total for existing condition is MA11, which combines existing and recommended wilderness and primitive lands.

[3] Total for existing condition isMA12, which combines eligible and designated wild and scenic rivers.

[4] Total for existing condition is MA14, which combines research natural areas and experimental forests.

[5] Does not include overlapped MAs, but only where MA1b is primary (see mapping hierarchy as described in chapter 3 of the revised Forest Plan)

Table 2. Comparison of Some Key Indicators for Revision Topics by Alternative

Revision Topic (some Key Indicators)	Alternative			
	A	B Modified	C	D
Vegetation				
Forest composition, structure, and pattern	Least improvement towards DFC[1]	Greatest improvement towards DFC[1]	Second greatest improvement towards DFC[1]	Third greatest improvement towards DFC[1]
Carbon Sequestration	Greatest amount of carbon sequestered	Third highest amount of carbon sequestered	Second highest amount of carbon sequestered	Least amount of carbon sequestered
Fire				
Use of fire (prescribed and wildfire)	Lowest emphasis	Second most emphasis	Most emphasis	Third most emphasis
Fuel treatment/risk reduction	Lowest emphasis	Most emphasis	Third most emphasis	Second most emphasis
Watersheds, Soils, Riparian and Aquatic Habitat/Species				
Trend in watershed condition, water quality, soil productivity, riparian ecosystem function, and quality of aquatic habitats	Overall improvements, based on current and historical accomplishments in restoration efforts and activities	More rapid improvement than C or D. Vegetation restoration emphasis, would likely target areas that include other active restoration opportunities for soil and aquatic resources and also includes a balance with passive restoration opportunities	Potentially slower improvement, because of emphasis towards “passive restoration” with amount of land area allocated within MA1 – MA5.	Although more land allocated to MA6, compared to other alternatives, potentially slower improvement with the emphasis in commodity based management which could offset effects of active and passive restoration efforts
Terrestrial Wildlife				
Changes in forest composition, structure, and pattern.	See Vegetation section above	See Vegetation section above	See Vegetation section above	See Vegetation section above
Acres of security habitat	Least acres of security habitat	Second most acres of security habitat	Most acres of security habitat	Third most acres of security habitat

Revision Topic (some Key Indicators)	Alternative			
	A	B Modified	C	D
Vegetation				
Access and Recreation				
Percent of the Forest where roads & trails may be designated for motor vehicle use	*96 percent*	*91 percent*	*85 percent*	*91 percent*
Percent of the Forest where over-snow vehicle use is allowed	*82 percent*	*79 percent*	*74 percent*	*79 percent*
Percent of the Forest where mechanized use is allowed	*99.5 percent*	*93 percent*	*87 percent*	*94 percent*
Recommended Wilderness				
Acres of recommended wilderness (includes overlapping MAs)	147,000 acres	161,400[2] acres	331,100 acres	138,100 acres
Timber				
Suitable for Timber Production	928,900 acres	950,900 acres	906,500 acres	982,300 acres
Percent Suitable	37 percent	38 percent	36 percent	39 percent
Predicted Volume Sold.	46.8 MMBF	44.6 MMBF	43.3 MMBF	46.3 MMBF
Allowable Sale Quantity (ASQ)	124.9 MMBF	120.3 MMBF	115.9 MMBF	131.3 MMBF

[1] Desired Forest Condition (DFC)

[2] There are an additional 19,700 acres allocated to MA1e, Primitive Areas, under this alternative. Primitive areas would be managed similar to recommended wilderness except mechanized and motorized over-snow use would be allowed.

Chapter 1. Purpose of and Need for Action

Introduction

The U.S. Department of Agriculture (USDA), Forest Service, has prepared this final environmental impact statement (FEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This FEIS discloses the environmental consequences that could result from the proposed action and alternatives. The document is organized as follows:

- **Chapter 1. Purpose of and Need for Action –** This chapter includes information on the history of the proposal, the purpose of and need for the action, and the Agency's proposal for achieving that purpose and need. This chapter also describes the public involvement process.
- **Chapter 2. Alternatives, including the Proposed Action –** This chapter describes the alternatives developed to address the purpose and need for change. It also describes alternatives not considered in detail. A summary comparison of alternatives is provided at the end of the chapter.
- **Chapter 3. Affected Environment and Environmental Consequences –** This chapter describes current conditions on the Idaho Panhandle National Forest (IPNF) and the environmental consequences of implementing each alternative.
- **Chapter 4. List of Preparers –** This chapter provides a list of preparers and agencies consulted during the development of the EIS.
- **Glossary –** The glossary provides definitions of terms used in this document.
- **Appendices –** The appendices (separate document) provide additional detailed information in support of the analyses presented in the EIS.
- **Map –** There is a separate, large-scale map of the management areas for Alternative B Modified. Maps of management areas for Alternatives C and D are the same as published with the DEIS, and are not reprinted with the FEIS.

Proposed Action

The Forest Service proposes to revise the Land Management Plan (hereafter referred to as the “revised Forest Plan”) for the IPNF. This revised Forest Plan is proposed to meet legal and regulatory requirements; and to address changes, issues, and concerns that have arisen since the Forest Plan was released in 1987. The area covered under this revision is shown in figure 2.

The draft Environmental Impact Statement (DEIS) with the draft Forest Plan were published December of 2011 using the 1982 planning procedures as allowed by the 2000 Planning Regulations. The Notice of Availability was published January 6, 2012 in the *Federal Register*. The first notice indicated a 45 day comment period. The notice was corrected to specify our preference for a 90 day comment period. The comment period was extended 30 days, closing on May 7, 2012.

On March 23, 2012 the agency established a new planning rule (the 2012 Rule). The 2012 Planning Rule provides transition language at 36 CFR 219.17(b)(3), allowing the responsible official to elect to use the provisions of the prior planning regulations (1982 Planning Rule, dated September 30, 1982, and as amended) to prepare plan amendments and revisions. The responsible official has elected to follow the provisions of the planning regulations in effect prior to May 9, 2012, referred to collectively in this document as the 1982 Planning Rule.

The Planning Area

The IPNF consists of major portions of three individual proclaimed national forests: the Kaniksu, the Coeur d'Alene, and the St. Joe. In 1973, major portions of these three forests were combined to be administratively managed as one national forest (for ease of discussion throughout this document, the Idaho Panhandle National Forests will be referred to as the IPNF or Forests when referencing the single administrative unit, the staff that administers the unit or the National Forest System (NFS) lands within the unit).

The IPNF are divided into five ranger districts, which are also the geographic areas (GA) defined within the revised Forest Plan: Bonners Ferry, Coeur d'Alene River, Priest Lake, Sandpoint, and St. Joe. Together, they consist of more than 2.5 million acres of public lands in the panhandle of north Idaho, with small areas extending into eastern Washington and western Montana (figure 2). Of the total 2.5 million acres, about 2,351,100 acres are in Idaho, 31,200 in Montana, and 118,400 acres in Washington. Access into the Forest is via Interstate 90 and U.S. Highways 95 and 2, and Idaho State Highways 200, 57, 1, 3, and 6.

The IPNF as a whole is characterized by several mountain ranges interspersed with large lakes and extensive river valleys. The Selkirk Mountains, Cabinet Mountains, Purcell Mountains, Coeur d'Alene Range, and Bitterroot Range are all part of the rugged terrain of the IPNF. Lakes Coeur d'Alene, Pend Oreille, and the upper and lower Priest are dominant water features in the area. Major river valleys consist of the St. Joe, Coeur d'Alene, Priest, Pend Oreille, Clark Fork, and Kootenai.

The Forest contains some of the most diverse and productive forests in the Northern Region of the Forest Service. It is the home of several threatened and endangered plant and animal species, and it provides a diversity of aquatic and terrestrial habitats. Grizzly bear, woodland caribou, Canada lynx, bull trout, and Spalding's catchfly are examples of some of these rare and listed species.

The principal population centers within the IPNF are Coeur d'Alene and Sandpoint, Idaho. Some of the smaller communities that have social, economic, and historic ties to the IPNF include St. Maries, Wallace, Kellogg, Priest River, Bonners Ferry, and Priest Lake. The nearest larger urban area, Spokane, Washington, has a social and economic influence on the local communities. The majority of land administered by the IPNF is located in Boundary, Bonner, Kootenai, Benewah, and Shoshone counties in Idaho and Pend Oreille County in Washington (table 3). Smaller portions of land are also found in Lincoln and Sanders counties in Montana, and Latah and Clearwater counties in Idaho. Logging, mining, and ranching have played important roles in many of these communities throughout the history of the area and continue to do so in varying degrees today.

Recreation opportunities abound in the IPNF. Visitors come from across the nation, as well as Spokane and local communities, to fish and boat the numerous rivers and lakes. Other popular recreation activities include hiking, biking, sightseeing, horseback riding, hunting, off-highway vehicle use, recreational prospecting, snowmobiling, skiing, gathering forest products, driving for pleasure, and wildlife viewing. This visitation and recreation is important to the local economy and is a major reason people choose to live in this area.

Figure 2. Idaho Panhandle National Forests Area Map

Table 3. Acres and Percent Administered by the IPNF, by County

County	Acres Administered by IPNF	Percent of County Administered by IPNF
Benewah, ID	26,100	5%
Bonner, ID	431,100	35%
Boundary, ID	487,300	59%
Clearwater, ID	3,000	<1%
Kootenai, ID	245,800	29%
Latah, ID	12,900	2%
Lincoln, MT	21,800	1%
Pend Oreille, WA	119,900	13%
Sanders, MT	6,200	<1%
Shoshone, ID	1,149,500	69%
Total Acres	**2,503,600**	

Purpose

The purpose of the action is to revise the 1987 Forest Plan for the IPNF. The final Forest Plan will guide natural resource management activities on the Forest, addressing changed conditions and direction that have occurred since the original Plan was released, while meeting the objectives of federal law, regulation, and policy.

Need

The forest supervisor initiated revision based on legal requirements and significant changes that had occurred in conditions and demands since the 1987 Plan went into effect. The Analysis of the Management Situation (AMS) (2003) documents the need to establish or change forest plan management direction. Revision is also warranted because the Plan is beyond the 10 to 15 year duration provided by the National Forest Management Act (NFMA) (16 U.S.C. 1606(e) (5) (A)).

Under the 1982 planning procedures, instructions to revise forest plans were formulated in the Code of Federal Regulations (CFR) at 36 CFR 219.10(g), 1982:

> "A forest plan shall ordinarily be revised on a ten-year cycle or at least every 15 years. It also may be revised whenever the forest supervisor determines that conditions or demands in the area covered by the plan have changed significantly, or when changes in Resource Planning Act policies, goals, or objectives would have a significant effect on forest level programs."

Need for Change

The revision of the Forest Plan is based on a need for change. The need for change approach analyzes the entire Plan and proposes changes to the 1987 Forest Plan where adjustments are necessary.

Monitoring and evaluation of implementation of the 1987 Forest Plan has helped identify management concerns, new issues, new information, and better ways to achieve goals, desired conditions, and objectives. Inventory information about the Forest's land and water resources is more accurate than it was in 1987, as a result of continued updates and new data management tools. The Forest now has geographic information system (GIS) technology, which greatly enhances analysis and the revision process. Knowledge of the physical, biological, and social processes occurring on the Forest has improved and increased during the life of the 1987 Forest Plan. This new and emerging information contributes to the need for revision.

The revision focuses on the most compelling needs for change in Forest Plan direction. These changes are generally important enough to:

- Affect large areas;
- Change the mix of goods and services produced; or
- Involve decisions in management direction where there is no public consensus on the best course of action.

Revision Topics

Revision topics are broad categorizations of major issues that identify where resource conditions, technical knowledge, or public perceptions of resource management have created a potential "need for change." The revision topics are the focus of this Forest Plan revision process. They address the central issues and public concerns to which future management of the IPNF must respond. The revision topics provide the basis for development of the Proposed Action and alternatives.

The AMS identified seven primary 'need for change' or revision topics.

- Vegetation
- Fire Risk
- Watershed and Aquatic Species
- Terrestrial Wildlife
- Access and Recreation

- Recommended Wilderness
- Timber Production

The following is a summary of each revision topic, including an issue statement, a description of the need for changes, and key indicators. For more information on revision topics, see the AMS.

Vegetation

Issue Statement: Forest Plan management strategies may affect the composition, structure, and landscape pattern of forests. This could influence the susceptibility and resiliency of the forests to significant disturbance agents such as large intense wildfires, insect and disease epidemics, weather events, and climate change.

Need for Change: The focus on vegetation was largely due to concerns that the forest composition, structure, and pattern had shifted away from historical conditions to the extent that ecosystems, and the goods and services that it provided, may not be sustainable, especially in light of potential impacts from climate change.

This issue was used to develop desired condition descriptions for vegetation at various scales (e.g., forestwide and for each of three biophysical settings) and was used in the development of management direction (goals, desired conditions, objectives, standards, and guidelines). The analysis conducted for this issue focuses on changes that may occur to forest composition, structure, landscape patterns of forest conditions, and the resistance and resiliency of the forest to disturbances and stressors, and lastly, the ability of the forest vegetation to sequester carbon. This analysis provides a foundation for how terrestrial vegetation may influence other resources such as wildlife habitat, aquatic resources, timber production, and fire hazard.

Key Indicators

- Forest composition and structure – predicted changes to tree species composition and structure (tree size classes, old growth, and snags);
- Landscape pattern of the forests – potential changes to the pattern of forest conditions (e.g., successional stages, species composition, tree density, and fuels) on the landscape;
- Resistance and resiliency of the forest vegetation to disturbances and stressors – effects of the alternatives on the hazard of wildfire, key insects and diseases, weather disturbances, and climate change; and
- Carbon sequestration.

Fire

Issue Statement: Forest Plan management strategies may affect the restoration and maintenance of the fire-adapted ecosystems on the IPNF. In the wildland urban interface (WUI), the Forest Plan management strategies may affect the amount, arrangement, and type of hazardous fuels that exist; and therefore, the risk that potential wildfires pose to life, private property, and other values in these areas (e.g., campgrounds, utility improvements, communication sites, and scenery values).

Need for Change: In order to restore and maintain the fire-adapted ecosystems on the Forest, there is a need to expand the use of fire (both planned as well as natural, unplanned ignitions) as a management tool.

A substantial amount of acreage on the IPNF is fairly remote in terms of road access. In many of these areas, it can be difficult or undesirable to use mechanical treatments to manage the vegetation in order to help achieve the desired forest conditions. Therefore, in these areas, it is especially important to consider the use of natural, unplanned ignitions when and where it is appropriate.

The AMS identified fire risk in the WUI as a growing concern since the 1987 Forest Plan was developed and recognized the need for more direction and emphasis on this issue in the final Forest Plan.

Key Indicators

- How much, where, and under what conditions planned and natural, unplanned ignitions may be used to help achieve desired conditions; and
- How much fuel treatment is anticipated and the relative reduction in hazard that could occur.

Watershed, Soils, Riparian, Aquatic Habitat, and Aquatic Species

Issue Statement: Land management activities conducted under the Forest Plan management strategy have the potential to affect soil productivity, alter the distribution and abundance of aquatic species, change water quality, and modify riparian function.

Need for Change: There are two primary reasons that the 1987 Forest Plan needs to be revised for watershed and aquatic dependent resources. The first is to establish management direction that recognizes and emphasizes watershed restoration activities and the second is to address changes in the physical and biological components of the aquatic ecosystem: such as water quality impairments, threatened, endangered, and sensitive species, soil productivity, and riparian and aquatic habitat conditions.

Key Indicators

- Trend in watershed condition rating;
- Trend in soil productivity;
- Trend in water quality;
- Trend in riparian ecosystem function; and
- Trend in quality of aquatic habitats.

Terrestrial Wildlife

Issue Statement: Forest Plan management strategies may affect habitat for terrestrial wildlife species, including species that are listed or proposed for listing under the Endangered Species Act (ESA), Northern Region sensitive species, and forest management indicator species (MIS).

Need for Change: Since the 1987 Forest Plan, several changes have occurred that resulted in subsequent modifications in how we manage both species and habitats. The revised Forest Plan needs to address these changes.

Species listed as threatened and endangered have changed. Additionally, the sensitive species list has been amended. Knowledge related to habitat management for grizzly bear continue to evolve.

Items such as fragmentation, patch size, biodiversity and ecosystem management strategies have evolved and need to be incorporated into the Forest Plan. Current plan direction for special habitats may not be adequate. In 2001, it was determined that the Migratory Bird Treaty Act applied to all federal agencies. The state of Idaho completed an elk management plan in 1999, with specific habitat and population goals and objectives that did not always match those found in the Forest Plan (Idaho Fish and Game 1999).

The analyses done in preparation for the Forest Plan revision show that physical and biological components of terrestrial wildlife habitats have changed, resulting in increased or decreased suitable habitat, depending on the wildlife species.

Key Indicators

- Changes in forest composition, structure, and pattern; and
- Security habitat (non-motorized areas).

Access and Recreation

Issue Statement: Forest Plan management strategies may affect recreation resources, experiences, and opportunities.

Need for Change: Access, specifically the motorized and non-motorized use of National Forest System (NFS) lands is recognized as one of the most controversial topics, both internally and externally, in forest management today. Because of this level of controversy, it is appropriate to address motorized and non-motorized use as part of the Forest Plan revision.

The 1987 Plan does not provide adequate direction to address the changes in recreation demands, technology, and shifts in management practices that have occurred over the past two decades. This issue was used in the development of forestwide and MA direction.

Key Indicators

- Percent of the Forest and location of areas where roads and trails may be designated for motor vehicle use;
- Percent of the Forest and location of areas where over-snow vehicle use is allowed;
- Percent of the Forest and location of areas where mechanized use is allowed;
- Percent of the Forest and location managed in the various recreation opportunity spectrum (ROS) classes; and
- Percent of the Forest managed for various scenery management systems and scenic integrity objective categories.

Recommended Wilderness

Issue Statement: Management strategies for recommended wilderness may affect recreation opportunities and experiences within recommended wilderness areas.

Need for Change: There is continuing controversy associated with the management of IRAs, as well as updating guidance provided in the 1987 Forest Plan to reflect current direction for recommended wilderness. Evaluation of existing wilderness and areas for wilderness potential is a requirement of Forest Plan revision (1982 regulations 36 CFR 219.17).

Key Indicator

- Acres of recommended wilderness.

Timber

Issue Statement: Forest Plan management strategies may affect the amount of lands suitable for timber production and sustainable timber volume managed by the Forest.

Need for Change: The 1987 Forest Plan established an allowable sale quantity (ASQ) as the maximum level of timber that could be harvested. Timber production levels have been well below the ASQ established in the 1987 IPNF Plan. While timber harvest levels have not exceeded the maximums established in the ASQ, they also have not met expectations for management and output levels. Even though ASQ is the maximum harvest level, there was an expectation by the public that this level was achievable and predicted. The analysis conducted for the 1987 Forest Plan used this level of harvest in estimating effects from timber management on other resources and the impact to local jobs and income. With the reduced timber harvest level, there is a need to reanalyze timber harvest levels and estimate the effects on other resources and the local communities.

The management direction in the 1987 Forest Plan emphasized the production of timber, with the majority of MAs allowing or promoting timber management. In the 1990s, the Forest Service began to focus on ecosystem management and ecological sustainability. This change in policy and direction resulted in a decreased emphasis on commercial timber production and an increased emphasis on timber harvest as a tool to restore vegetation or as a means to address other resource requirements or needs. There is a need to reanalyze timber harvest levels and revise them.

In addition, evaluation of timber suitability is required to be reviewed every 10 years (1982 regulations 36 CFR 219.14). Since the adoption of the 1987 Forest Plan, many changes to timber suitability have occurred.

Key Indicators

- Number of acres suitable for timber production;
- Allowable sale quantity and predicted timber volume sold; and
- Long-term sustained yield capacity.

Other Topics

Additional topics were identified where there is a need to incorporate current law, regulation, or policy as well as current data and science. The Plan direction that addresses these topics is common to all action alternatives:

- Air Quality
- Lands and Special Uses
- Wild and Scenic Rivers
- Research Natural Areas
- Special Areas
- Experimental Forests
- Cultural Resources

- American Indian Rights and Interests
- Minerals
- Grazing
- Special Forest and Botanical Products
- Social and Economic systems
- Cooperation and Community Involvement

Public Involvement

In April 2002, a notice of intent (NOI) was published in the *Federal Register*, announcing that revision of the 1987 LMP had begun and asked for comment on preliminary issues, topics, and the preliminary proposed action. Informal discussions with the public regarding needed changes to the current Forest Plan began with a series of public meetings in 2002. This input, along with science-based evaluations, was used to determine the need for change. Additional meetings, correspondence, news releases, comment periods, and other tools were utilized to gather feedback from the public, forest employees, tribal governments, federal and state agencies, and local governments.

In March 2003, the AMS and AMS Technical Report (USDA Forest Service 2003 March) were released to the public. The AMS documented the need for change, the seven primary revision topics, and the IPNF proposed action identified from public comment and internal (Forest Service) input.

From April 2002 to May 2004, the IPNF hosted public meetings, open houses, field trips, and workgroup meetings. Approximately 19 informational and comment meetings in and around the local communities took place during the scoping process, which started in April 2002, with the NOI in the *Federal Register* and ended in May 2004. In addition to the public meetings, briefings and meetings were held with the Tribes, Congressional representatives, other elected officials, other agencies, and interest groups.

In addition, the IPNF hosted approximately 72 workgroup meetings from August 2003 to May 2004. These meetings were held in the communities within the IPNF and the workgroups focused on the geographic areas (GAs) surrounding each of these communities. The purpose of these workgroup meetings was to: 1) share information about the revision topics; 2) collaboratively discuss and develop desired conditions for each of the revision topics within the workgroup's GAs; and 3) gain an understanding of the issues and appreciation of others' viewpoints.

A draft Content Analysis Report, prepared in 2004, summarized what the IPNF had learned from people that responded to the preliminary proposed action, revision topics, and need for change. The report was based on information from various public and workgroup meetings, open houses, field trips, invited group presentations, and meetings with tribal partners, agency partners, and elected officials up to that time.

Under the 1982 planning procedures, the Forest was required to prepare an EIS in conjunction with the revised LMP. Therefore, beginning in June 2004, based on what the IPNF learned during internal and external public participation and collaboration, the Forest and revision interdisciplinary team (IDT) developed alternative themes utilizing and identifying suitable uses for various forest management purposes. These themes were designed to reflect a mix of different management philosophies based on the Forest's dialogue with members of the public, other agencies and governments, tribal partners, and employees. These alternative themes were shared with the public and workgroups during meetings held in the winter of 2004-2005.

In January of 2005, a new planning rule was released, that did not require an EIS, and thus, a final set of alternatives was never developed. Emphasis shifted to the development of a "starting option" map. The starting option map was created utilizing the preliminary alternatives, revision topics, public scoping comments, and input from the workgroups and other meetings.

The starting option map and associated direction, was the focus of many public/workgroup meetings in July to September of 2005. The purpose of the workgroup meetings was for a diverse group of people to come together to discuss the starting option map and try and reach agreement on potential changes to suggest to the forest supervisor. From July to September 2005, the IPNF hosted 18 workgroup meetings in the same communities focusing on the same GAs. The purpose of these workgroup meetings was to: 1) share the starting option map and discuss how it was developed; 2) validate the information on the starting option map; and 3) collaboratively discuss any possible changes to the starting option map. In addition to the workgroup meetings, briefings and meetings were held with the Tribes, Congressional representatives, other elected officials, other agencies, and interest groups. Several elected officials, Congressional staffers, and other agency representatives participated in the workgroup meetings.

In October 2005 the draft Proposed Plan map was released to the public and workgroups, showing the major changes and providing the rationale for changes to the starting option map. The revision IDT incorporated input from the starting option map into the Proposed Land Management Plan, which was released on May 12, 2006, for a 90-day public comment period. The comment period was extended an additional 30 days and ended September 11, 2006. Released along with the Proposed Land Management Plan was the draft Comprehensive Evaluation Report (CER). The draft CER built upon the AMS and documented the evaluation of the 1987 Forest Plan and proposed changes. The draft CER evaluated current social, economic, and ecological conditions and trends that contribute to sustainability and served as the principle document that supported the need to establish, amend, or revise a Plan. The draft CER identified factors that affect conditions and trends, and included information of what are causing conditions to change, and described the influence plan implementation would have on moving toward desired conditions.

Public comment on the Proposed Plan and draft CER was analyzed and documented in a report, *The Analysis of Public Comment Report* (March 2007). Based on public and agency comments the revision IDT began to develop the final LMP. A court injunction (March 30, 2007) resulted in suspension of Forest Plan revision activities under the 2005 Planning Rule. The 2008 Planning Rule was released in April of 2008 and Forest Plan revision resumed under that Rule. A final Plan release was anticipated for winter of 2009 when a court ruling invalidated the 2008 Planning Rule in June 2009. The 2000 Planning Rule was reinstated in December of 2009. The 2000 Planning Rule was amended in 2002 to allow the Forest Service to follow the procedures of the 1982 Planning Rule.

The Forest issued a second NOI in March 2010 to revise the Forest Plan using the 1982 procedures under the 2000 Planning Rule. All the public comment received on the various plan revision products over the life of the Plan revision were used in developing the draft Forest Plan and DEIS.

The draft Forest Plan and DEIS were released for public comment in January of 2012. Open houses were held in the communities throughout the Forest in January to share information regarding the documents and the process for commenting. The initial 90-day comment period for the draft EIS was extended an additional 30 days through May 7 of 2012. Numerous meetings were held with interested publics and elected officials during the 120 day comment period. Comments received during this 120-day comment period have been responded to in appendix G of the FEIS.

Decision Framework

The responsible official for this analysis is the regional forester. Based on the analysis and subsequent public comments, the responsible official will select an alternative to revise the Forest Plan and document the rationale in a record of decision (ROD). Forest Plan approval results in:

1. Establishment of forestwide multiple-use goals and objectives, including a description of the desired condition of the IPNF and an identification of the quantities of goods and services that are expected to be produced during the planning period, as required by 36 CFR 219.11(b);
2. Establishment of forestwide standards and guidelines to fulfill the requirements of 16 USC 1604 applying to future activities and resource integration requirements in 36 CFR 219.13 through 219.27;
3. Establishment of Management Area (MA) direction (multiple-use prescriptions) with associated standards and guidelines, including possible actions(see appendix A of the revised Forest Plan), as required by 36 CFR 219.11(c);
4. Establishment of monitoring and evaluation requirements that provide a basis for a periodic determination and evaluation of the effects of management practices, as required by 36 CFR 219.11(d);
5. Recommendation of wilderness to Congress as required by 36 CFR 219.17(a); and
6. Determination of suitability and potential capability of lands for resource production (timber and grazing), as required by 36 CFR 219.14 and 219.20.

The Plan will set a course of action for managing the Forest for the next 10 to 15 years. However, project level environmental analysis will still need to be completed for specific proposals to implement the direction in the Forest Plan.

Related Decisions Which Implement the Forest Plan

The six Forest Plan decisions listed above are strategic. Implementation of the Forest Plan generally requires a site- or project-specific analysis and decision(s). However, there are situations where a site-specific decision is made at a strategic level, with the Forest Plan ROD. For example, a strategic decision may allocate an area as non-motorized to provide quiet recreation or to protect wildlife in winter range. To provide for this type of condition, the Plan would include a standard to not allow motor vehicle use. The Forest Plan ROD would then make a site-specific decision that restricts where motorized use can and cannot occur across broad areas and closure orders would be simultaneously issued with the decision.

Relationship to Other Entities

Forest Service planning regulations require the agency to consider other federal, state and local government, and tribal plans and policies. As part of the outreach effort, a number of discussions with federal, state, local, and tribal representatives were initiated.

County Governments

Beginning with initiation of the planning process, local government officials from the counties within the IPNF lands were invited to participate in Forest Plan development. All county plans were considered as the planning process developed.

State

Several Idaho State agencies are affected by, or affect, Forest Service management. These include the Idaho Department of Fish and Game; the Idaho State Parks and Recreation; the Idaho Department of Environmental Quality; the Idaho Soil and Water Conservation Commission; and the Idaho Department of Transportation. The Forest coordinated information with State agencies during all phases of the plan revision process. Those offices provided formal comments during the scoping and other public involvement stages. Statewide assessments were considered in the development of the revised Forest Plan.

In addition, the Forest worked with the Idaho Roadless Commission to ensure the revised Forest Plan was compatible with the Idaho Roadless Rule. Adjustments were made to the management area boundaries for Alternative B Modified to provide consistency with the Rule.

Tribes

During development of the revised Forest Plan, the IPNF consulted with the Kootenai Tribe of Idaho, the Kalispel Tribe, the Coeur d′Alene Tribe, the Confederated Tribes of the Colville Reservation, the Nez Perce Tribe, and the Spokane Tribe of Indians. The KNF took the lead to consult with the Confederated Salish and Kootenai Tribes on forest plan revision. As a result, specific tribal comments were incorporated in this EIS and revised Forest Plan.

Federal

Management of federal lands adjacent to the IPNF was considered in the formulation of alternatives and their cumulative effects.

Consideration of national scenic and historic trails, utility corridors, recommended wilderness, and other management concerns across boundaries were discussed with the Colville and Clearwater National Forests. The forests met to ensure management problems weren’t created because of IPNF revised Forest Plan direction.

Relationship to Other Assessments or National Policy

There are several broad scale assessments or national policies in place that affect management decisions on the IPNF. Following is a brief description of these assessments or policies and their effect on the IPNF Plan revision.

National Scale

In March 1999, the Committee of Scientists published a report entitled, “Sustaining the Peoples’ Lands: Recommendations for Stewardship of the National Forests and Grasslands into the Next

Century" (USDA Forest Service 1999). This report emphasizes ecosystem management and the need for sustainability of all forest lands. The report also emphasizes the need for standards and guidelines, or any other technical requirements, to be based on scientific research. The IPNF has incorporated this guidance by using accepted scientific data and recovery plans as the basis for developing resource-specific requirements.

Policy decisions such as the Healthy Forests Initiative, National Fire Plan, and the Associated Cohesive Strategy direct the management of national forests to curb uncharacteristic wildfire and reduce the risks to people, property, and resources. These policies, where compatible with the biological and physical capabilities of the land and other national forest objectives, were considered in the development of the proposed action.

In July 2010, the Chief of the Forest Service announced the National Roadmap for Responding to Climate Change and the Performance Scorecard. The Forest, in partnership with the Kootenai National Forest (KNF), completed a USDA Forest Service Kootenai and Idaho Panhandle National Forests Planning Zone (KIPZ) Climate Change Report (USDA Forest Service 2010b), parts of which are incorporated in this EIS, and where applicable, used to guide revised Forest Plan elements.

Regional Scale

Regional assessments consider different geographic scales and can help identify or maintain future public land management options. As part of the context for revision efforts, it was important to consider the findings and management strategies contained in these larger assessments, such as the Columbia River Basin Assessment (2003), Northern Region Overview (USDA Forest Service 1998 October), INFISH (USDA Forest Service 1995), and how they applied to the Forest.

Forestwide Scale

In August 2002, the social and economic assessment for the IPNF was completed under private contract. An analysis on conditions and trends of the social and economic environment for the planning zone was also completed in 2006. This information was used in describing current conditions and as a basis for the effects analysis.

In October 2008, the Special Areas; Roadless Area Conservation; Applicability to the national forests in Idaho (Idaho Roadless Rule (see 36 CFR 294 Subpart C)) was made into law. The Rule designated 250 Idaho Roadless Areas and established five management themes that provide prohibitions with exceptions or conditioned permissions governing road construction, timber cutting, and discretionary mineral development (73 FR 201 [61456-61496]). The Rule provided a basis for MA direction for inventoried roadless areas on the IPNF that are in Idaho.

Monitoring and Evaluation reports for the 1987 Forest Plan contributed significantly to the knowledge of the need for change.

Chapter 2. Alternatives, Including the Proposed Action

Introduction

This chapter describes and compares the alternatives considered for the IPNF revised Forest Plan. This section also presents the alternatives in comparative form, describing the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. The revision includes changing all, or a portion of, the programmatic decisions that make up the Plan. This chapter provides the following five discussions:

1. Development of alternatives;
2. Elements common to all alternatives;
3. Description of each alternative;
4. Alternatives considered but eliminated from detailed study; and
5. Comparison of alternatives.

Development of Alternatives

As discussed in chapter 1, this revision of the Forest Plan is based on "need for change." Only those topics specifically identified as a need for change, are being changed. A list of key issues, or revision topics, based on the need for change was identified. These topics drove alternative development. A list of issues common to all alternatives was also developed. Some additional items are addressed in the revision because they are required by planning regulations (i.e., 36 CFR 219.14 through 219.26 (1982)).

Alternative A, the "no-action alternative," reflects current management practices under the 1987 Forest Plan, as amended and implemented, and provides the basis for comparing alternatives to current management and levels of output. While all alternatives provide a wide range of multiple uses, goods, and services, some give slightly greater emphasis to selected resources based on the theme of the alternative and response to revision topics.

Alternatives to the no-action alternative were based on the need for change identified in the AMS (2003), implementation and monitoring of the current Plan, workgroup meetings (2003-2004), informational and comment meetings (2002-2004), public issues raised during review of the AMS and scoping, public comments on the Proposed Land Management Plan in 2006, comments received on the NOI published in 2010, and comments on the draft Forest Plan and DEIS (2012). Alternatives represent a range of possible management options from which to choose. Each alternative emphasizes specific land and resource uses and de-emphasizes other uses in response to the revision topics. This is done by changing management area allocations, resulting in trade-offs between the alternatives.

Forest Plans do not make budget decisions. However, alternatives emphasize different programs to different degrees, with an expectation of appropriate funding. Should Congress emphasize specific programs by appropriation, a redistribution of priorities would follow, regardless of the alternative implemented.

All reasonable alternatives to the Proposed Action must meet the purpose and need for change and address one or more of the revision topics. These alternatives are considered for detailed study. However, not all possible alternatives were carried into detailed study as the list of options would have been prohibitively large. Instead, the responsible official identified those alternatives that both met the criteria and created a reasonable range of outputs, direction, costs, management requirements, and effects from which to choose.

Important Points about all Alternatives

All alternatives represent, to varying degrees, the philosophies of multiple-use and ecological and economic sustainability. The alternatives provide basic protection of Forest resources and comply fully with environmental laws. All the alternatives would:

- Meet law, regulation, and policy;
- Incorporate ecosystem management objectives and strategies and contribute towards ecological, social, and economic sustainability;
- Meet the purpose and need for change and address one or more significant issues (revision topics);
- Provide integrated restoration direction as included in the forestwide goals, desired conditions, objectives, standards, and guidelines;
- Retain all existing permitted activities and facilities[1]; and
- Provide sustainable and predictable levels of products and services.

The Preferred Alternative

The responsible official, the regional Forester for the Northern Region, has identified Alternative B Modified as the preferred alternative for this final EIS. The preferred alternative is reflected in the revised Forest Plan and rationale for its selection is documented in the draft ROD which accompanies this document.

Description of Alternatives

Management Areas

For the action alternatives, management area prescriptions have been grouped into categories which have similar management characteristics. For example, MA1 is broken down into subcategories, which represent designated wilderness (MA1a), recommended wilderness (MA1b), wilderness study areas (WSA) (MA1c), and primitive lands (MA1e). Management areas range from little human-caused alteration to the Forest (MA1 − wilderness) and focus on passive management to more substantial human-caused change (MA7 – primary recreation areas) and focus on active management. Each alternative allocates different amounts of land to the MA. For a more complete description of categories and MA prescriptions, see the revised Forest Plan. Alternative A (1987 Forest Plan as amended and implemented) was not remapped with these new MAs. Table 4 displays whether there is a MA from the 1987 Forest Plan that corresponds to the revised Forest Plan, or whether this is a new MA.

[1] All permits will be reviewed for compliance with the new Plan. Any permit found to be out of compliance will be brought into compliance as soon as practicable using a variety of tools, including modifications or amendments to the permit.

Table 4. Revised Forest Plan Management Area Descriptions Common to All Action Alternatives

MA	Category	Category Description	1987 MA
1a	**Wilderness Designated**	The IPNF manage one Congressionally designated wilderness area – the Salmo-Priest Wilderness as part of the National Wilderness Preservation System. The Salmo-Priest Wilderness totals 41,335 acres, of which 9,900 acres are on the IPNF, in the state of Washington. This MA only applies to the portion of the Salmo-Priest Wilderness on the IPNF. If, over the life of this Plan, Congress designates any additional wilderness areas on the IPNF, those areas would be allocated to this MA (FSM 1923 and 2320; FSH 2409.19).	11
1b	**Recommended Wilderness**	These areas are recommended as additions to the National Wilderness Preservation System. The wilderness character and potential for each area recommended to be included in the National Wilderness Preservation System is to remain intact until Congressional action is taken. This MA, if within an IRA in Idaho, has additional management requirements as described in the Idaho Roadless Rule (see 36 CFR 294 Subpart C).	11
1c	**Wilderness Study Area**	The IPNF manage one wilderness study area (WSA) – Grandmother Mountain WSA (6,900 acres) located on the St. Joe Ranger District.	New
1e	**Primitive Lands**	These areas have wilderness characteristics and are different from recommended wilderness (MA1b) because winter motorized recreation (snowmobiling) and mountain biking are desirable uses and allowed in these areas. This MA, if within an IRA in Idaho, has additional management requirements as described in the Idaho Roadless Rule (see 36 CFR 294 Subpart C).	New
2a	**Designated Wild and Scenic Rivers**	This MA applies to river segments that have been identified as designated for inclusion as part of the Wild and Scenic Rivers System under the authority granted by the Wild and Scenic Rivers Act of 1968, as amended.	12
2b	**Eligible Wild and Scenic Rivers**	This MA applies to river segments that have been identified as eligible for inclusion as part of the Wild and Scenic Rivers System under the authority granted by the Wild and Scenic Rivers Act of 1968, as amended.	12
3	**Special Areas**	These areas are administratively designated areas and managed to protect and conserve the values for which they were identified.	13
4a	**Research Natural Areas (RNAs)**	The IPNF have 20 established RNAs, two recommended RNAs, and one addition to an existing research natural area.	14
4b	**Experimental Forests**	Two existing experimental forests are located on the IPNF: Priest River Experimental Forest and Deception Creek Experimental Forest.	14
5	**Backcountry**	This MA is relatively large areas without roads and provides a variety of motorized and non-motorized recreation opportunities. This MA, if within an IRA in Idaho, has additional management requirements as described in the Idaho Roadless Rule (see 36 CFR 294	10,20

MA	Category	Category Description	1987 MA
		Subpart C).	
6	**General Forest**	Most of this MA consists of relatively large areas with roads, trails, structures, and signs of Forest management activities. This MA provides a variety of recreation opportunities, both motorized and non-motorized. This MA contains lands suitable for timber production, with timber harvest contributing to regulated timber harvest estimates. Some lands within this MA are generally not suitable for timber production, based on the timber suitability. This MA, if within an IRA in Idaho, has additional management requirements as described in the Idaho Roadless Rule (see 36 CFR 294 Subpart C.	Mixture of: 1,2,3,4,5,6,7, 9,15,16,17
7	**Primary Recreation Areas**	This MA applies to six areas on the IPNF. They contain a variety of recreation sites and areas that provide an array of recreational opportunities and experiences in a forested environment.	17

Elements Common to Alternatives

All alternatives in this document adhere to multiple use and sustained yield of goods and services (36 CFR 219.1(a), (b)). In addition, they share objectives and standards for managing forest resources and complying with applicable laws and policies. They also contain the same direction to contribute to the diversity of desired native and non-native plant and animal communities and contribute toward the recovery of threatened and endangered species. Forestwide direction identified in the Plan would apply to all action alternatives. The difference between alternatives is primarily the difference in allocation of acres by MA to meet the purpose and need for change and address one or more of the revision topics.

Each alternative was developed with the intent of complying with all applicable law and regulation, as well as national policy and direction, including but not limited to the Healthy Forests Initiative, National Fire Plan, and National Energy Policy. Each alternative retains the following existing decisions to the 1987 Forest Plan and their associated Biological Opinion:

- Inland Native Fish Strategy (INFISH) (Decision Notice and Finding of No Significant Impact (1995));
- Northern Rockies Lynx Management Direction (ROD, USDA Forest Service 2007 March); and
- Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones (USDA Forest Service 2011b and 2011c).

Direction for the retained decisions is located in appendix B of the revised Forest Plan.

The draft Forest Plan and DEIS included the retained decision of the *Designation of Energy Corridors on Federal Lands in the 11 Western States* (U.S. Department of Energy [USDE] & USDI Bureau of Land Management [BLM], 2008). This has been dropped as a retained decision in the revised Forest Plan and FEIS. This decision did not include any direction for the forest plan except for the designation of additional utility rights-of-way corridors. These additional corridors are included in appendix D of the revised Forest Plan.

The following would not change between alternatives:

- **Revised Forest Plan Goals, Desired Conditions, Standards, and Guidelines –** Management area and forestwide direction for goals, desired condition, standards, and guidelines remains constant for all action alternatives.
- **Experimental Forests –** Allocation of Experimental Forests (MA4b) remains constant for all action alternatives.
- **Developed Recreation Sites –** Existing developed recreation sites are retained in all alternatives. Alternatives do not make decisions to remove or to create developed recreation sites. Allocation of primary recreation areas (MA7) remains constant for all action alternatives.
- **Utility Rights-of-Way and Communication Sites –** Direction for, and location of, designated utility rights-of-way and communication sites remains constant for all alternatives.
- **Wild and Scenic Rivers –** Direction for, and allocation of, designated and eligible wild and scenic rivers (MA2a and 2b) remains constant for all action alternatives.
- **Wilderness Study Area –**The Grandmother Mountain Wilderness Study Area and its management would continue as outlined by the Land Exchange Acts (the Act of 1992, [P.L. 102-584] and the Act of 2006, [P.L. 109-372]) regardless of which alternative is selected for implementation.
- **Designated Wilderness –** The Salmo-Priest Wilderness Designation remains constant for all alternatives.

Alternative A – No-action Alternative

This alternative reflects the 1987 Forest Plan, as amended to date, and accounts for current laws and regulations. New information, inventories (e.g., tentatively suitable timber lands), and technologies (e.g., Spectrum Model) were used to evaluate this alternative. Output levels were recalculated for this alternative based on Forest Plan amendments and new sources of information. The no-action alternative retains the 1987 Forest Plan goals, objectives, standards, and guidelines, and MA prescriptions, as amended. This alternative serves as the baseline for comparison with the action alternatives.

This alternative satisfies the NFMA procedures (36 CFR 219.12(f)(7)) to reflect the current level of goods and services provided by the Forest and the most likely amount of goods and services expected to be provided in the future, if current management direction continues.

Alternative A Relationship to Revision Topics and Need for Change

Vegetation: The 1987 Forest Plan does not contain direction on moving towards historic conditions or to improve resistance and resiliency in the light of climate change. Continued deviation from historic conditions would lead to changes in disturbance and succession processes, making it difficult to provide for a sustainable ecosystem. The 1987 Forest Plan contains a direction for setting aside and managing old growth stands.

Fire: Under the 1987 Forest Plan, each MA lists standards for planned and unplanned ignitions. The AMS identified several impediments to the use of natural, unplanned ignitions to meet resource objectives in the 1987 Forest Plan. The MAs were numerous and generally small in size. Adjoining MAs often had different or unclear direction on the use of natural, unplanned ignitions to meet resource objectives and this resulted in creating a difficult situation for developing subsequent fire management plans and implementing an integrated fire management program. Also, because the 1987 Forest Plan did not contain an emphasis or much analysis on using natural, unplanned ignitions to meet resource objectives, it was generally believed that the Plan did not adequately authorize the use of that tool.

Watersheds, Soils, Riparian, and Aquatic Habitats/Species: Legacy effects from past timber harvest, mining, and other human-caused disturbances continue to effect watershed condition and health. The 1987 Forest Plan, as amended by the INFISH (USDA Forest Service 1995), provides a passive conservation/restoration strategy and reduces the risk to watersheds and aquatic biota from many current land management activities. INFISH standards and guidelines contain general direction for addressing negative effects from past management related to roads, livestock grazing, and recreation, but is lacking for other resources (e.g., timber harvest, mining) and did not address the need to actively restore watershed, soil, and aquatic ecosystems.

Terrestrial Wildlife: Since the 1987 Plan, research shows that certain forest cover types are not as well represented as they were historically. There has been a shift from late and early succession forest to a more uniform mid-succession forest. The size of uninterrupted blocks of forest is smaller than it was historically. Current direction for some habitats may not be adequate for species needing those habitats (e g., snags, down wood).

Access and Recreation: Roads would continue to be managed to meet requirements (36 CFR 212). Motorized recreation opportunities on roads and trails would be determined by project level travel management decisions and displayed on motor vehicle use maps (MVUMs). Alternative A would continue to provide both motorized and non-motorized recreational opportunities as well as opportunities for mechanized use (e.g., mountain bikes) and over-snow motorized use. Existing developed recreation sites would be maintained. Dispersed recreation opportunities would continue to be available. Motor vehicle use may be allowed (on roads and trails) on 96 percent of the NFS lands on the IPNF. Over-snow vehicle use would be allowed on 82 percent and mechanized use on 99.5 percent of the land base.

Recommended Wilderness: The 1987 Forest Plan recommended additions to the Salmo-Priest Wilderness, (17,600 acres) and recommended three new areas: Scotchman Peaks (23,900 acres), Mallard-Larkins (78,500 acres), and Selkirk Crest (26,700 acres).

Timber: Based on historic and current condition and trends, timber harvest levels would continue to be well below the ASQ in the 1987 Plan of 280 million board feet (MMBF) and fall short of expectations. Direction is to maximize growth and yield through short rotations, high use of regeneration harvest, and intensive timber management. The 1987 Forest Plan emphasizes timber production and does not incorporate ecosystem management and principles of ecological sustainability. Suitable timberlands would continue to be adjusted to make corrections to the 1987 Forest Plan. Based on adjustments for Plan amendments and new data, lands suitable for timber production equal 928,900 acres or 37 percent of the Forest. Based on modeling for Plan revision, the predicted volume sold for the first decade is 46.8 MMBF and the ASQ (unconstrained budget) 124.9 MMBF.

Alternative B Modified – Proposed Action

This alternative describes the revised Forest Plan that responds to the identified purpose and need. This alternative was designed around numerous public meetings and public comments on the AMS and the May 2006 proposed Management Plan. This alternative emphasizes moving towards desired conditions and contributing to ecological, social, and economic sustainability. Alternative B Modified would manage approximately 5 percent of the Forest as recommended wilderness (MA1b), 27 percent as backcountry (MA5), and 60 percent as general forest (MA6) (see figure 3).

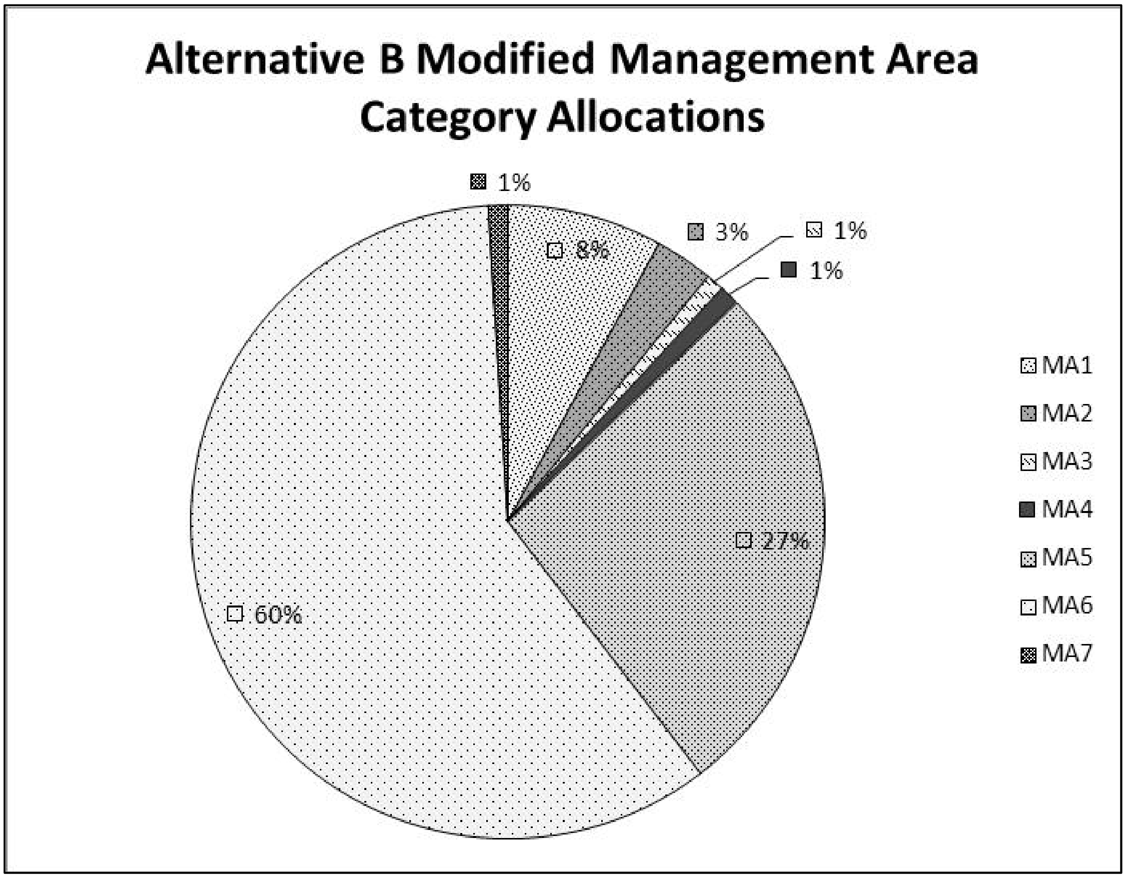


Figure 3. Allocation by MA Group – Alternative B Modified

Alternative B Modified Relationship to Revision Topics

Vegetation: Movement towards desired future condition would be emphasized in MA6 (60 percent of the Forest) and would rely on a variety of management techniques (e.g., timber harvest, planting, thinning, natural unplanned ignitions, planned ignitions, and mechanical fuel treatment). MA1 and 5 (approximately 35 percent of the land allocation in this alternative) emphasize using natural ecological processes (e.g., plant succession) and disturbances (e.g., fire, insects, and diseases) as the primary forces affecting the vegetation. Management practices to restore vegetation on these MAs would include natural, unplanned ignitions to meet resource objectives and planned ignitions. Some mechanical treatments (e.g., timber harvest) may occur in backcountry (MA5) areas. The amount of acres of ponderosa pine, western larch, and white pine increase while Douglas-fir and lodgepole pine decrease. The amount of large/very large stands and lands managed for old growth increase over time.

Fire: This alternative emphasizes the use of natural, unplanned ignitions to meet resource objectives and planned ignitions in the backcountry (MA5 — 681,200 acres). The direction also emphasizes hazardous fuels reduction in the WUI.

Watersheds, Soils, Riparian, and Aquatic Habitats/Species: Under Alternative B Modified and relative to the other alternatives, there would potentially be the most rapid trend toward desired conditions for these resources, through a combination of active and passive restoration efforts, with passive restoration emphasized in MA1 through 5 and active restoration focused primarily in areas allocated to MA6. The potential for more vegetation management under this alternative assumes a corresponding potential for increased restoration activities in other resource areas as the Forest moves towards a more integrated approach to resource management.

Terrestrial Wildlife: This alternative allocates 188,700 acres to MA 1and 681,200 acres to MA5 which would maintain areas of large undisturbed land and habitat for forest interior species. These MAs also emphasize natural processes with minimal human intervention/disturbance, providing wildlife security habitat. This alternative also has opportunities for active restoration of vegetation conditions (wildlife habitat) that are currently outside of desired conditions (MA6 – 60. percent or 1,507,000 acres).

Access and Recreation: Motorized recreation opportunities on roads and trails would be determined by travel management decisions and displayed on MVUMs. Alternative B Modified would provide the opportunity for motor vehicle use (may be allowed on roads and trails) on 91 percent of the Forest. Over-snow vehicle use would be allowed on 79 percent of the Forest and mechanized use (e.g., mountain bikes) on 93 percent of the Forest. Dispersed recreation opportunities would continue to be available with some improvements made to concentrated use areas.

Recommended Wilderness: This alternative recommends 161,400 acres for wilderness (Mallard Larkins, additions to Salmo Priest, Scotchman Peaks, and Selkirk).[1]

Timber: There are 950,900 acres suited for timber production (or 38 percent of the Forest). The predicted volume sold for the first decade is 44.6 MMBF/year and the ASQ (unconstrained budget) is 120.3 MMBF/year.

[1] 19,800 additional acres would be allocated to MA1e, Primitive Areas, under this alternative. Primitive areas would be managed similar to recommended wilderness except mechanized and motorized over-snow use would be allowed.

Alternative C

Alternative C emphasizes wilderness values and protection of backcountry (MA5) while moving towards desired conditions. To move towards watershed and vegetation desired conditions there is an increased emphasis on natural disturbance processes, with an increased use of natural, unplanned ignitions to meet resource objectives. There is also an increased emphasis on prescribed fire, in addition to mechanical treatments, to move towards desired conditions. Alternative C would have more opportunities for backcountry non-motorized recreation (MA1 – 335,300 acres; MA5 – 630,000 acres) and more acres recommended as wilderness (MA1b 331,100 acres) than any other alternative (see figure 4). About 56 percent would be allocated to general forest (MA6).

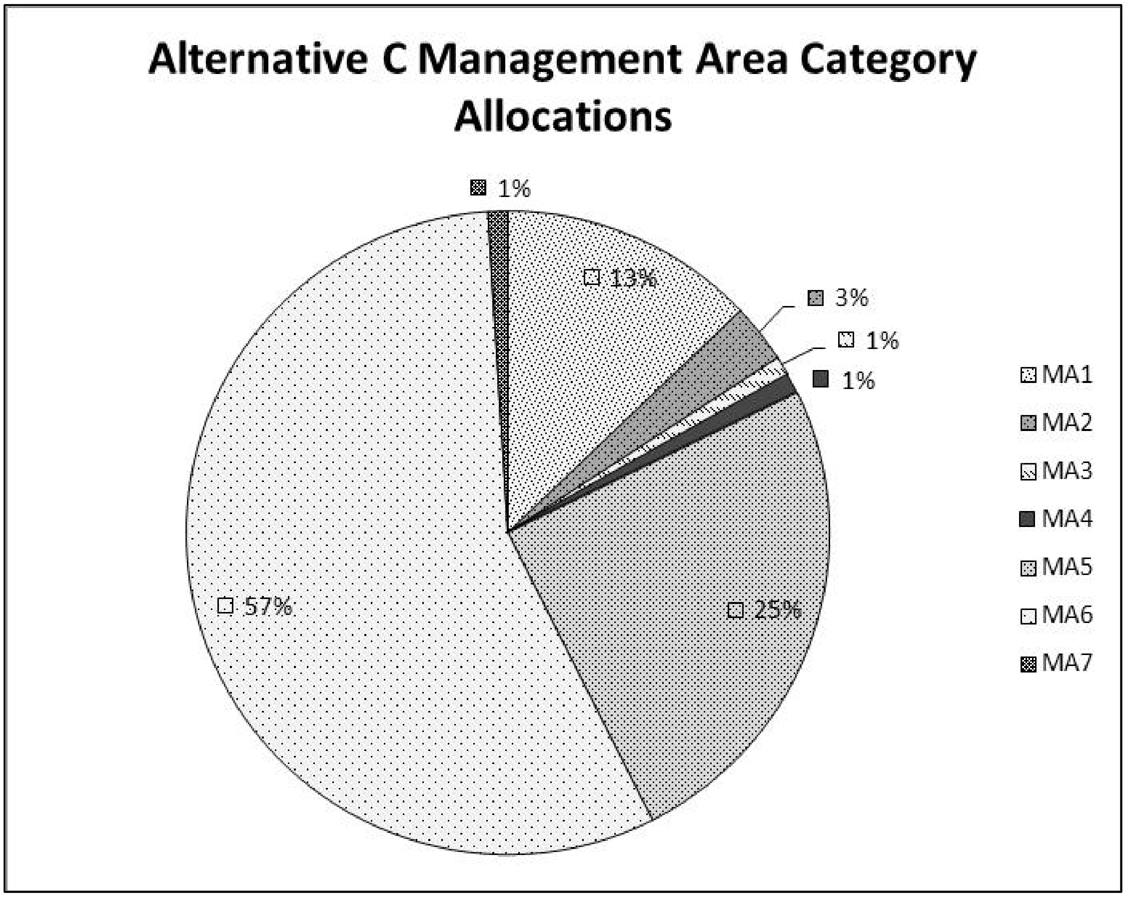


Figure 4. Allocation by MA Group — Alternative C

Alternative C Relationship to Revision Topics

Vegetation: Movement towards desired condition would be emphasized in MA6 (57 percent of the Forest) and would rely on a variety of management techniques (e.g., timber harvest, planting, thinning, natural unplanned ignitions, planned ignitions, and mechanical fuel treatment). MA1 and 5 (approximately 39 percent of the land allocation in this alternative) emphasize using natural ecological processes (e.g., plant succession) and disturbances (e.g., fire, insects, and diseases) as the primary forces affecting the vegetation. Management practices to restore vegetation on these MAs would include natural, unplanned ignitions to meet resource objectives and planned ignitions. Some mechanical treatments (e.g., timber harvest) may occur in backcountry areas. The amount of acres of ponderosa pine, western larch, and white pine increase while Douglas-fir and lodgepole pine decrease. The amount of large/very large stands and lands managed for old growth increase over time.

Fire: This alternative emphasizes unplanned ignitions to meet resource objectives and planned ignitions in all MAs except MA3, 4, and 7. Natural, unplanned ignitions and planned ignitions are important tools for moving vegetation towards desired condition and reducing fuel hazard, particularly in the backcountry (MA5). Hazardous fuels would continue to be reduced in the WUI.

Watersheds, Soils, Riparian, and Aquatic Habitats/Species: Improvements to watersheds, soil resources, riparian ecosystems, and aquatic habitats/species would continue to occur, although potentially slower than other alternatives, because of relatively more emphasis towards a passive restoration strategy, given the relatively larger amount of land area allocated in MA1 through MA5,.

Terrestrial Wildlife: This alternative allocates 335,300 acres to MA1 and 630,000 acres to MA5 which would maintain areas of large undisturbed land and habitat for forest interior species. These MAs emphasize natural processes with minimal human intervention/disturbance, providing wildlife security habitat. There would be less land available for active restoration of habitat for native species preferring open-canopied, large-tree forest conditions (MA6 – 57 percent of the Forest or 1,420,200 acres).

Access and Recreation: Motorized recreation opportunities on roads and trails would be determined by travel management decisions and displayed on MVUMs. Alternative C would provide the opportunity for motor vehicle use (may be allowed on roads and trails) on 85 percent of the Forest. Over-snow vehicle use would be allowed on 74 percent and mechanized use (e.g., mountain bikes) on 87 percent of the Forest. Dispersed recreational opportunities would continue to be available with few improvements made to concentrated use areas.

Recommended Wilderness: This alternative recommends 331,100 acres for wilderness.

Timber: There are 906,500 acres (36 percent of the Forest) suited for timber production. The predicted volume sold for the first decade is 43.3 MMBF/year and the ASQ (unconstrained budget) is 115.9 MMBF/year.

Alternative D

This alternative emphasizes achieving desired future conditions through mechanical means. Under this alternative, timber production is emphasized while moving towards desired vegetation conditions. This alternative has the most acres available for timber production and motorized access with 63 percent allocated to MA6 (general forest) (see figure 5). There would be fewer acres allocated to recommended wilderness (MA1b – approximately 5 percent of the Forest) and backcountry (MA5 –25 percent of the Forest).

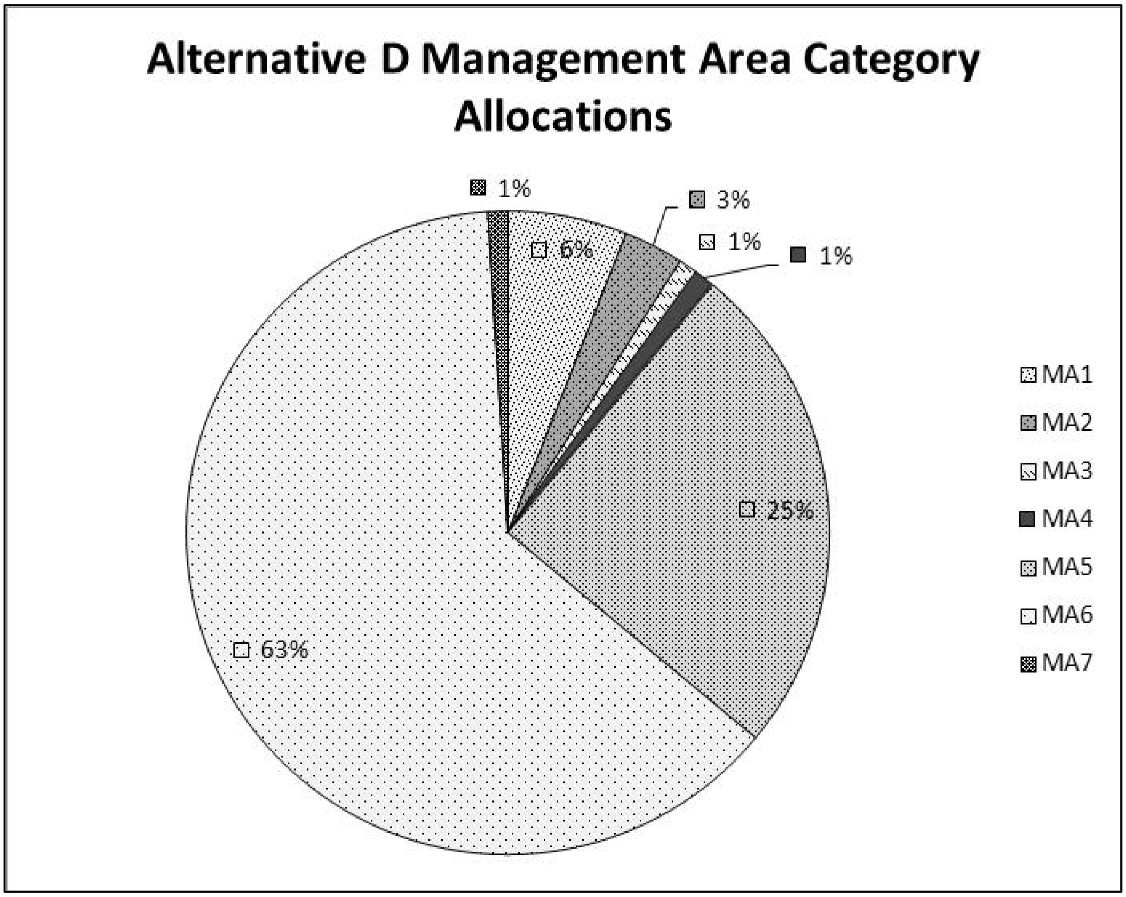


Figure 5. Allocation by MA Group – Alternative D

Alternative D Relationship to Revision Topics

Vegetation: Movement towards desired future condition would be emphasized in MA6 (63 percent of the Forest) and would rely on a variety of management techniques (e.g., timber harvest, planting, thinning, natural unplanned ignitions, planned ignitions, and mechanical fuel treatment). Timber management and production is emphasized while moving towards vegetation desired conditions. MA1 and 5 (approximately 35 percent of the land allocation in this alternative) emphasize using natural ecological processes (e.g., plant succession) and disturbances (e.g., fire, insects, and diseases) as the primary forces affecting the vegetation. Management practices to restore vegetation on these MAs would include natural, unplanned ignitions to meet resource objectives and planned ignitions. Some mechanical treatments (timber harvest) may occur in backcountry areas. The amount of acres of ponderosa pine, western larch, and white pine increase while Douglas-fir and lodgepole pine decrease. The amount of large/very large stands and lands managed for old growth increase over time.

Fire: Hazardous fuels would be reduced in the WUI and other areas where values are at risk. Fuels will be actively treated. Under this alternative, use of unplanned ignitions to meet resource objectives and planned ignitions would be utilized in backcountry MAs while the use of planned ignitions, and timber harvest practices would be utilized on the rest of the Forest.

Watersheds, Soils, Riparian, and Aquatic Habitats/Species: Improvements to watersheds, soil resources, riparian ecosystems, and aquatic habitats/species would continue to occur and there would be an emphasis in active restoration, given the relatively larger amount of land area allocated in MA6; however the subsequent trend towards the desired condition could be offset by the potential impacts from the emphasis in timber management and timber production.

Terrestrial Wildlife: This alternative would have the greatest amount of land available for active restoration of those vegetation communities that are outside of desired conditions. It would also have the least emphasis on security habitat due to the greater emphasis on motorized use. Insects and disease would be actively controlled and prevented.

Access and Recreation: Motorized recreation opportunities on roads and trails would be determined by travel management decisions and displayed on MVUMs. Alternative D would provide the opportunity for motor vehicle use (may be allowed on roads and trails) 91 percent of the Forest. Over-snow vehicle use would be allowed on 79 percent and mechanized use on 94 percent of the land base. Dispersed recreation opportunities would continue to be available with some improvements made to concentrated use areas.

Recommended Wilderness: This alternative would recommend 138,100 acres for wilderness.

Timber: This alternative has the highest amount of timber production from suitable timberlands. There are 982,300 acres (39 percent of the Forest) suited for timber production. The predicted volume sold for the first decade is 46.3 MMBF/year and the ASQ (unconstrained budget) for the first decade is 131.3 MMBF/year.

Alternatives Considered But Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of this revision effort or duplicative of the alternatives considered in detail. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below. Public comments received on the DEIS and draft Forest Plan included some suggestions for additional alternatives. See the response to comments for additional information regarding alternatives considered and eliminated from detailed study.

The 1987 Forest Plan

This alternative was considered as the IDT was developing a no-action alternative. This alternative is identical to Alternative A, which was described previously, except that the outputs would be those stipulated in the 1987 Plan. For example, the ASQ would be as shown on page II-13 of the 1987 Forest Plan.

This alternative was considered, but not analyzed in detail because it has been apparent since the early monitoring and evaluation reports that the timber outputs projected in the 1987 Plan cannot be achieved. Alternative A provides a more realistic baseline for comparing current management to Alternatives B Modified, C, and D than would this alternative.

Forest "Restoration" Alternative

This alternative responds to public comment to eliminate commercial extraction and uses (e.g., logging), eliminate commercial grazing, eliminate motorized use in IRAs and wilderness, eliminate off-road all-terrain vehicles (ATV) and over-snow motorized use, eliminate ASQ from inventoried roadless areas, and recommend all IRAs as wilderness.

The revision process for all alternatives recognizes the importance of functioning ecosystems. This was identified in the AMS. The revised Forest Plan direction includes desired conditions as well as standards and guidelines for each MA. Alternatives studied in detail look at varying degrees of allowing commercial timber harvest. In addition, appropriate use of timber harvest is needed in order to address a number of Need for Change topics (i.e., Vegetation, need to improve composition, structure, and landscape patterns; Timber, need to provide a reasonable level of goods and services; and Fire, need to provide strategies to affect the amount, arrangement, and types of hazardous fuels in the WUI).

National forests were established and are managed for a variety of multiple uses. No scientifically credible rationale was provided by the commenter's requesting these actions as to why these resource uses should be discontinued, other than personal. Motorized use is already not permitted in congressionally designated Wilderness. The IDT developed alternatives that looked at providing a broad range of non-motorized use within roadless areas; many of the IRAs were designated to varying amounts to MA1b – recommended wilderness; or MA5 – backcountry allocations. Most of the inventoried roadless area lands would not be suitable for timber production under any action alternative, although timber harvest could still be used as a tool to meet management objectives in some areas. No information has been identified on the need to eliminate commercial grazing.

Conservation Alternative

This alternative would place heavy emphasis on restoration of damaged lands and rivers and restoring declining fish and wildlife populations. It would also prohibit approval of new resource extraction or road building projects, unless the Forest Service establishes that it has adequate funding to monitor and/or maintain such projects throughout their lifetime. This alternative would give special emphasis to river health, including protection of riparian areas, wetlands, aquatic species, and water quality. This would include prohibiting any activities that would harm sensitive, threatened, or endangered aquatic species. This alternative would also require the Forest Service to take specific actions to improve water quality on water quality limited stream segments and to maintain good water quality where it already exists. This alternative would identify certain areas that should be targeted for special protection due to their ecological importance or their sensitivity. This alternative would include separate, more prescriptive standards for mining operations that protect streams, roadless areas, fish, wildlife, and other resource values. This alternative would place strict limits on the method and location of new road construction.

Many restoration activities are already occurring and are projected to continue to occur under any alternative (stream restoration, road decommissioning, and fuels treatment). Forestwide and MA direction emphasizes restoration, ecosystem resiliency, and improved watersheds trending toward desired ranges for vegetation composition, structure, patterns, and processes; incorporating climate change; and striving to maintain sustainable recreation and other uses across the Forest. The IDT felt that the conservation emphasis outlined in this proposed alternative was adequately addressed Alternatives B Modified and C.

Wilderness/Roadless Related Alternatives

All roadless areas determined to be capable and available for wilderness were considered by the IDT for inclusion as recommended wilderness. The Forest evaluated 48 IRAs for wilderness recommendation. The full set of capable and available areas represents the maximum potential for wilderness recommendations. The last step of the evaluation process is to determine if the area is needed as part of the National Wilderness Preservation System. The assessment focused on social and ecological factors. Social factors included current levels of use in designated wilderness in the Northern Region, national and local trends in outdoor activities, and population statistics. Ecological factors included the representation of vegetation cover types and ecological sections, fisheries, and wildlife.

The Idaho Roadless Rule (36 CFR 294 Subpart C) applies to inventoried roadless areas managed by the IPNF that are within the state of Idaho. This rule was promulgated in 2008 (73 FR 201). The Rule designated management direction for roadless areas in Idaho. This rule went through a separate public review and analysis process. The rule states “the prohibitions and permissions set forth in the rule are not subject to reconsideration, revision, or rescission in subsequent project decisions or land and resource management plans or revisions undertaken pursuant to 36 CFR 219” (36 CFR 294.28). Therefore, the rule provides higher level management direction for roadless areas in Idaho and limits the scope of changes made in this Forest Plan revision effort. The rule only provides management direction for road construction, reconstruction, timber cutting, and discretionary mineral development as these are the factors that have been found to substantially affect roadless character. Based on this higher level direction, all the IPNF alternatives were developed to align to the management designations and/or direction in the Idaho Roadless Rule, except for Alternative C.

This Plan is being developed under the 1982 planning procedures. The 1982 procedures require roadless areas to be evaluated and considered for recommendation as potential wilderness. The 1982 procedures require alternatives to be distributed between the minimum and maximum resource potential to reflect, to the extent practicable, the full range of major commodity and environmental resource uses and values that could be produced from the Forest. The EIS considers one alternative (Alternative C) that examines wilderness potential of lands beyond those identified in the Idaho Roadless Rule as Wild Land Recreation management classification theme. An alternative with less recommended wilderness than identified in the Idaho Roadless Rule was not considered in detail. Alternative D provides the lower end of the spectrum for recommended wilderness and is consistent with the Idaho Roadless Rule. Alternative B Modified contains more recommended wilderness than Alternative D, while being consistent with the Idaho Roadless Rule.

Recommending Additional Roadless Areas for Wilderness

Some people wanted additional roadless areas recommended as wilderness; however, they did not explicitly identify areas to consider. As noted above, the IDT evaluated each roadless area for its inherent capability and availability to be considered for wilderness. Alternative C recommends seven areas as wilderness (331,100 acres) versus Alternative B Modified (the proposed action) which recommends four areas (161,400 acres) as wilderness and 19,800 acres as primitive lands (MA1e). The IRAs not recommended for wilderness were primarily placed into MA5 (or MA3). These designations also limit activities, such as road construction and timber cutting that could affect wilderness character. In Alternative C 1,420,200 acres were placed into General Forest. These areas are consistent with the Idaho Roadless Rule which also placed them into general forest, rangeland, and grassland theme.

Wild River Designation

Some commenter’s wanted to see wild river designation only for those rivers that lie within wilderness. Wild river designation is based on a rivers ability to provide certain attributes; not its overlap with MAs.

Additional Eligible Wild and Scenic River Designation

Some commenters wanted to see additional rivers designated as eligible wild and scenic rivers. One group had a supporting inventory document (Colburn et al. 2011), while others name requested streams within their comment letter with little supporting information. A systematic inventory of named streams and rivers was completed by the IPNF as part of the Forest Planning Process, as required by Forest Service Manual policy and the Wild and Scenic River Act. Documentation of this inventory and the resulting eligible wild and scenic rivers is documented in appendix E. To be eligible, a river must be free flowing and possess at least one outstandingly remarkable value that is rare, unique, or exemplary. A comparison was made between the inventory conducted by the IPNF and the streams and rivers requested by commenters. Although some of the streams and rivers are the same, commenters requested several additional rivers that were not designated as eligible wild and scenic rivers by the IPNF. The following rivers are not included in any IPNF action alternatives for the following reasons:

> **Moyie River:** This creek was found by Colburn and Hoffman to have recreation and historic values. This river was designated as a Study River under the Wild and Scenic Rivers Act. The study concluded that the river did not have any outstandingly remarkable values and that the river should not be included in the National Wild and

Scenic Rivers System. Based on this study, the IPNF found the river is not eligible as a wild and scenic river.

Boulder Creek: This creek was found by Colburn and Hoffman to have recreation, scenery, fisheries, and wildlife values. Other commenters requested this creek be included, but did not list specific values. A concern was raised that the Federal Energy Regulatory Commission (FERC) is presently considering a preliminary permit application to construct a small hydropower facility on Boulder Creek. If Boulder Creek were designated as eligible for protection under the Wild and Scenic Rivers Act, FERC might be in a position to deny the permit. The IPNF inventory recognized the creek had historic values, based on historic mining and development, but they were not rare, unique, or exemplary. Therefore, this creek is not eligible as a wild and scenic river.

Boundary Creek: This creek was found by Colburn and Hoffman to have recreation values. Their comment letter also spoke to wildlife values for this area. The IPNF inventory found only historic values, based on past mining; however, it was not rare, unique, or exemplary. Therefore, this creek is not eligible as a wild and scenic river.

Smith Creek: This creek was found by Colburn and Hoffman to have recreation and wildlife values. The IPNF found no outstandingly remarkable values for this creek. Therefore, this creek is not eligible as a wild and scenic river.

Cow Creek: This creek was found by Colburn and Hoffman to have recreation, scenery, and wildlife values. The IPNF found no outstandingly remarkable values for this creek. Therefore, this creek is not eligible as a wild and scenic river.

Lion Creek: This creek was found by Colburn and Hoffman to have recreation, scenery, and fish values. This creek is entirely on state land, and is not covered by the IPNF Forest Plan.

Lightning Creek: Several commenters requested this creek be included but did not list specific values. One commenter stated the creek was the third largest tributary of Lake Pend Oreille, and includes old growth cedar stands, bull trout habitat, and premier recreational opportunities. The IPNF inventory found the creek had geologic values, but they were not rare, unique, or exemplary. Therefore, this creek is not eligible as a wild and scenic river.

North Fork St. Joe River: Several commenters requested this creek be included but did not list specific values. One commenter stated the river provides habitat for bull trout, westslope cutthroat trout, and a variety of recreational pursuits. The IPNF inventory found scenery, recreation, and historic values. However, the values are not rare, unique, or exemplary. Therefore, this creek is not eligible as a wild and scenic river.

Big Creek: Several commenters requested this creek be included but did not list specific values. One commenter stated the river provides habitat for bull trout, westslope cutthroat trout, and a variety of recreational pursuits. The IPNF found no outstandingly remarkable values for this creek. Therefore, this creek is not eligible as a wild and scenic river.

Slate Creek: This creek was found by Colburn and Hoffman to have recreation and scenery values. The IPNF found no outstandingly remarkable values for this creek. Therefore, this creek is not eligible as a wild and scenic river.

Marble Creek: This creek was found by Colburn and Hoffman to have recreation, scenery, and wildlife values. The IPNF inventory found some of these same values. However, after review of the inventory, it was found this creek had many splash dams built up and down the river in the first half of the 20th century, which has changed the character of the river. Many remnants of these splash dams remain. These remnants create artificial cataracts and blockages that continue to alter the creek's natural path and flow. Because the flow continues to be altered, the basic screening criterion of "free-flowing" is not being met; therefore, this creek was not considered as an eligible river for wild and scenic designation.

The number of additional creeks and rivers suggested for designation as eligible wild and scenic rivers supports the fact these are not rare, unique, or exemplary features. The IPNF has many creeks and rivers that support many of these values. The same is true when looking at wild and scenic rivers regionally. Neighboring forests, such as the KNF and the Clearwater, have several rivers designated as eligible wild and scenic rivers, and numerous additional rivers requested by the public for consideration as eligible for wild and scenic river designation. The additional streams and rivers are not rare, unique, or exemplary when considered on a forest or a regional basis.

IPNF Managed as Roadless Area Complexes

This alternative responds to public comment to identify and manage the Forest in roadless complexes. All roadless and unroaded areas would be free from road building, logging, and other development and resource extraction activities. This alternative was dropped from detailed study because it is similar to the alternatives considered in detail. Under Alternative B Modified, almost all of the lands in IRAs would be managed to retain their roadless character because they would be allocated to MA1 (168,300 acres) or MA5 (681,200 acres). Road construction and timber cutting would be limited in these areas to what is allowed under the Idaho Roadless Rule. Approximately 18,000 acres that fall under the Idaho Roadless Rule would be allocated to MA6 General Forest. Road construction and timber cutting would be permitted in these areas. These areas were allocated to General Forest because of their close proximity to communities and the need to provide vegetation management options to treat and reduce hazardous fuels. The MA6 in Idaho conforms to the general forest, rangeland, and grassland designation under the Idaho Roadless Rule; therefore, this designation is not being reconsidered here.

The comment also refers to managing unroaded areas as roadless. The analysis evaluated all lands with wilderness potential. Other "unroaded" parcels were addressed in the forestwide direction where they provided some pertinent resource protection. For example, some unroaded lands provide grizzly bear core habitat. Requirements for managing grizzly bear core habitat were made in the Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones. (USDA Forest Service 2011b and 2011c), and have been carried forward into all alternatives (FW-STD-WL-02). Other unroaded lands may provide secure areas for elk. The forestwide direction includes direction for increasing elk security (FW-OBJ-WL-02-Elk, FW-GDL-WL-13 Big game).

Reduction of Roadless Areas

Many public comments were received asking for a reduction of inventoried roadless areas and opening them up to access and timber harvest. Managing for timber production requires intensive activity and roads. It is possible to manage for timber production without roads; however, the cost to thin, treat fuels, or commercially thin and harvest are high. When projects involve IRAs, the planning cost alone becomes prohibitive. Based on past actions and cost of implementation, it did not seem reasonable to consider an alternative to manage for timber production in IRAs. If an area is not allocated for suitable timber in IRAs, it does not mean commercial timber harvest will not take place. Harvest may be the best tool to accomplish fuels reduction, vegetation improvement, or some other management objective. If removal for commercial value is decided; as the best means to meet the need for the project, after NEPA analysis at the project level, commercial harvest may take place. In addition, inventoried roadless areas within Idaho must follow the Idaho Roadless Rule (36 CFR 294 Subpart C). Inventoried roadless areas (outside of Idaho) must follow the 2001 Roadless Area Conservation Rule (36 CFR 294 Subpart B). See FW-STD-IRA-01 and FW-STD-IRA-02. Therefore, this alternative was not analyzed in detail.

Open All Roadless Areas to Snowmobile Use

Comments suggested that the Forest include an alternative that opened all roadless areas to over-snow vehicle use. Approximately 79 percent of the lands (regardless of whether they are in an IRA or not) within the IPNF allow over-snow vehicle use under Alternative B Modified, 74 percent under Alternative C, and 79 percent under Alternative D. All roadless areas outside MA1a (designated wilderness), MA1b (recommended wilderness), and MA4a (research natural areas) may be available for over-snow use based on MA direction.

Some areas on the Forest would remain closed in all alternatives due to a lawsuit settlement regarding the Selkirks and caribou habitat, until a site-specific winter travel plan is finalized. Other areas on the Forest are closed to over-snow vehicle use to provide non-motorized recreation opportunities like the cross-country ski trail system located on the south side of the 4th of July Summit and English Point. These areas provide opportunities for primitive and semi-primitive non-motorized recreation activities. Several other areas are closed to provide secure winter range for elk.

No Winter Motorized Recreation Alternative

This alternative was proposed as a means to evaluate the impact of winter recreation on wildlife habitat, particularly grizzly bear or other resources. The request that easily-accessible, non-motorized, winter recreation areas are provided on the Forest was addressed in Alternative C, with the emphasis on more recommended wilderness (MA1b). In addition, area closures for winter motorized use may occur where needed to protect wildlife and other resources under any of the alternatives.

Access and Roads

This alternative responds to public comments to open all available roads for use, make all trails and roads available to multi-use recreationalists, with no designation to any one particular user group. It would take out all gates and leave roads open on a year-round basis. This increased access would provide additional recreational opportunities for the general public. Consideration of an alternative to open all available roads and trails for use would adversely impact resources by not protecting big game winter range and sensitive wildlife habitats. This alternative would not provide wildlife security and could adversely impact threatened and endangered species. It also would not provide any quiet recreation opportunities. Therefore, it is not considered reasonable and was not analyzed in detail. In addition, the ROD for the Final Supplemental Environmental Impact Statement Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones USDA Forest Service, Kootenai, Lolo, and Idaho Panhandle National Forests (USDA Forest Service 2011b and 2011c) includes a set of motorized access and security guidelines to meet our responsibilities under the ESA (see Forest Plan standard FW-STD-WLF-03) to conserve and contribute to recovery of grizzly bears.

Pro-Motorized Recreation

This alternative responds to public comments to address the demand for increased OHV and motorized recreation opportunities. The alternative includes access to existing routes and areas. It also includes an adequate quantity and quality of beginning, intermediate, and advanced routes and trails for a wide cross-section of motorized visitors including motorcycles, ATVs, and four-wheel drive vehicles, with a quantity and quality at least equal to non-motorized routes. To address concerns over noise levels from motorized vehicles, the Forest Plan would provide a reasonable decibel limit for exhaust systems.

As described in chapter 1 of the Forest Plan, the Forest Plan is a programmatic document that does not make site-specific decisions. The key indicators described under the access and recreation revision topic in chapter 1 of the FEIS do not include individual trails, roads, or miles, but only areas available for different uses. Travel management for designating roads, trails, and areas for motor vehicle use as required by 36 CFR 212 Subpart B has been completed on the North and Central Zones of the IPNF, although changes may be considered during site-specific planning at the project level. Roads, trails, and areas where motor vehicle use is allowed are identified on the IPNF motor vehicle use map (MVUM). Travel management planning is being completed for the South Zone, with a decision expected in 2013, with an MVUM expected in 2014.

In addition, this alternative would adversely impact resources by not protecting big game winter range and sensitive wildlife habitats. This alternative would not provide wildlife security and could adversely impact threatened and endangered species. Therefore, it is not considered reasonable and was not analyzed in detail. In addition, the ROD for the Final Supplemental Environmental Impact Statement Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones USDA Forest Service, Kootenai, Lolo, and Idaho Panhandle National Forests (USDA Forest Service 2011b and 2011c) includes a set of motorized access and security guidelines to meet our responsibilities under the ESA to conserve and contribute to recovery of grizzly bears.

Site-Specific Travel Management

Some public comments requested that individual roads or trails, or all unclassified routes, be evaluated and decisions be made concerning their use through the revision process. However, a road-by-road or trail-by-trail review requires more site-specific analysis than would be practical during forest plan revision. The programmatic-level planning of forest plan revision provides a framework for integrated resource management and for guiding project and activity decision making. Site-specific travel analysis and subsequent project proposals, guided by the management direction established in the forest plan, is the appropriate level of planning to evaluate detailed travel management information such as the location, condition, and current uses of individual roads and trails.

The IPNF has published motor vehicle use maps (MVUMs) on the North and Central Zones that display those roads, trails, and areas designated for motor vehicle use by class of vehicle and time of year as required at 36 CFR Subpart B. Travel management planning is being completed for the South Zone, with a decision expected in 2013, with an MVUM expected in 2014. The revised Forest Plan will identify where motorized recreation may or may not be compatible with management area direction, but will not change any specific motor vehicle use designations (excluding over snow vehicle use). Ongoing district-level travel analyses and site-specific project planning will continue to evaluate road and trail designation opportunities as the MVUMs are reviewed and updated over the life of the Plan.

Small Sales only Alternative

Some groups were in support of an alternative that would employ the small, local mill owners and employees. This alternative would look at no more clear-cutting but would instead focus on smaller timber sales, the logging of smaller trees, and the use of single tree selection management and no even-age management (e.g., clear-cutting). Clear-cutting is considered a desirable tool to create openings for a variety of ecological and social benefits on the Forest. Other considerations, such as support to local mills and employees, could be applied at the project level to different projects and nothing in the Plan would prohibit this.

Wildlife Linkage Alternative

This alternative would respond to comments about habitat connectivity. Commenters requested the development of specific MAs for habitat linkages with their own set of goals, objectives, standards, and guidelines. In addition, commenters requested at least one Plan alternative be created to focus on maximizing habitat connectivity in the face of climate change.

Habitat connectivity was one of the major themes found throughout the wildlife analysis in the FEIS and wildlife specialist’s report. Additionally, it was analyzed in the ERG report (ERG 2012). Connectivity is a topic that is woven throughout the wildlife direction in the revised Forest Plan, the wildlife specialist’s report, and the “Wildlife” section of chapter 3 of the FEIS.

There was no need to have a separate MA designation for connectivity because of the direction present in the revised Forest Plan. The connectivity direction found in the Forestwide and GA sections apply regardless of MA. Additionally, there is MA direction in the revised Forest Plan that specifically states that certain MAs contribute to wildlife movement and security. Furthermore, the direction in the revised Forest Plan would be implemented by all action alternatives, which eliminates the need to have a separate “wildlife linkage” alternative. All of the action alternatives have a desired condition of facilitating movement between separated parcels of NFS lands, and maintain options to address wildlife crossing concerns as they develop.

The Old Growth alternative described below addresses old growth habitat connectivity and vegetation management on national forest lands.

Natural Fires

Some commenter’s wanted to let all natural fires (unplanned ignitions) burn to return to a natural cycle. In the AMS, several impediments to the use of fire were identified in the 1987 Forest Plan direction. Because the 1987 Forest Plan did not contain an emphasis or much analysis on the use of natural, unplanned ignitions, it was generally believed that the Plan did not adequately authorize the use of natural, unplanned ignitions to meet resource objectives. The use of natural, unplanned ignitions is allowed and promoted under all action alternatives. However, the Forest is unable to let all unplanned ignitions burn because of concerns with such things as private property, structures, facilities, and rare and unique habitats.

Old Growth Reserves, Linkages between Reserves, and Differing Management Direction for Old Growth Management

Some commenters suggested the designation of old growth reserves and linkages between reserves. Under this alternative, areas designated as old growth reserves would be assessed for restoration needs that would move them toward a desired condition. At the same time the non-reserve areas would be assessed for active timber management. Projects would proceed only after a comprehensive inventory process was completed that identified (mapped) all old growth and mature/late-successional forest for each “Old-Growth Management Unit” wholly or partially encompassed within the project area. This updated inventory would form the basis for the process to set-aside (commit to protecting) the old growth and mature/late-successional forests.

The concept of creating old-growth reserves was considered but the Forest determined not to carry this suggestion forward for a number of reasons. The scale of “Old-Growth Management Units” (approximately 10,000 acres) is too small to ensure that old growth is distributed across the Forest in a “natural” way that would support old growth associated species. Historically, stand-replacing fires have been larger than the size of the Old-Growth Management Units, having the potential to kill all existing stands of old growth in a unit. In addition, some areas of the Forest have had more old growth than others historically, due to variations in climate, topography, and other factors that influence fire return intervals and severities. Thus, the use of Old Growth Management Units would not capture the natural distribution of old growth on the landscape.

The action alternatives provide for protection and enhancement of old growth stands (see the “Vegetation” section of chapter 3 of the FEIS). Revised Forest Plan desired conditions provide for increases in the amount of lands managed for old growth while standards provide protection of stands that are currently old growth.

In addition, some people suggested that the Forest manage for a certain percentage of old growth by watershed and elevation and to prohibit new roads in old growth habitat. The action alternatives provide for increased amounts of old growth and protection of current old growth. In addition, MA allocations provide for large areas of little or no active vegetation management (i.e., MA1 and 5). The revised Forest Plan also includes a guideline that road construction or other developments should generally be avoided in existing old growth stands. Thus, these concerns have been incorporated into the action alternatives.

Varying/Additional Standards and Guidelines

Alternatives were suggested that would add additional guidelines or standards proposed in the Plan, or vary the levels of protection offered from the current ones by alternative. The requests included the following, among others:

Proposed Standards

- **Maximum road density –** Some commenters wanted road densities standards to be included in the revised Forest Plan to protect big game and other species, such as grizzly bears. The Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones (USDA Forest Service 2011b and 2011c), which is incorporated into the Plan for all alternatives, addresses the habitat requirements for grizzly bears. This decision established standards for total motorized open routes, which is similar to the concept of road densities. The action alternatives include management direction for elk by requiring a certain level of elk security in lieu of road densities. In addition, the alternatives incorporate different amounts of each MA. Alternative C allocates the most areas to recommended wilderness and backcountry, which provides lower road densities than the general forest areas.
- **No net gain in ATV or snowmobile access over the next 15 years –** This is considered indirectly through the alternatives. Alternative C essentially would result in no net increase in off-highway vehicle or snowmobile access over what currently exists.

Proposed Guidelines

- **More restrictive grazing –** Grazing is very limited on the IPNF. Based on the AMS and the analysis, the IDT did not find any reason to restrict grazing, nor was there any specific reasoning given by the commenter.
- **Permit motorized use in recommended wilderness –** Motorized use is a non-conforming use in wilderness; therefore, the alternatives do not permit motorized use in recommended wilderness so that the use does not become established. Instead, the alternatives included varying amounts of recommended wilderness to address this concern.
- **Stricter guidelines for watersheds/aquatics, access and recreation (seasonal closures, road and landing locations in riparian conservation areas, sediment transport, decommissioning) –** The alternatives incorporate forestwide and MA direction for watershed/aquatics. Based on the analysis, additional protective measures were not found to be warranted.

Conformance with the Resource Planning Act (RPA)

The National Forest Management Act (NFMA) regulations require development of at least one alternative which incorporates the Resource Planning Act (RPA) Program’s tentative objectives for each national forest (36 CFR 219.12(f)(6). The last RPA Program was developed in 1995. The Forest Service Strategic Plan 2007-2012, in lieu of an RPA Program, was completed in accordance with the Government Performance Results Act and the Interior and Related Agencies Appropriations Act. The Strategic Plan does not recommend outputs to incorporate in specific Forest Plans, but all alternatives analyzed in detail in this FEIS incorporate the broad strategic objectives.

Comparison of Alternatives

This section provides a summary of the land allocations and effects of implementing each alternative. Table 5 provides a comparison of management area allocations by alternative. Alternative A, the no-action alternative, is included even though it does not use the management areas shown in the revised Forest Plan. Where possible, Alternative A was crosswalked to the revised Forest Plan MAs for comparison purposes.

Table 5. Comparisons of Alternatives by Management Area Allocation, Acres*, and by Percent

MA	Alternative A		Alternative B Modified		Alternative C		Alternative D	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
1a	153,900[1]	6.2%	9,900	0.4%	9,900	0.4%	9,900	0.4%
1b			152,100	6.1%	318,500	12.8%	128,800	5.2%
1c	n/a		6,900	0.3%	6,900	0.3%	6,900	0.3%
1e			19,800	0.8%	0	0%	11,200	0.4%
2a	29,100[2]	1.2%	21,300	0.9%	21,400	0.9%	21,400	0.9%
2b			49,900	2.0%	42,200	1.7%	48,400	1.9%
3	6,800	0.3%	13,500	0.5%	13,200	0.5%	35,400	1.4%
4a	18,100[3]	0.7%	14,800	0.6%	14,100	0.6%	14,100	0.6%
4b			8,200	0.3%	8,200	0.3%	8,200	0.3%
5	n/a		681,200	27.3%	630,000	25.2%	624,900	25.0%
6	n/a		1,507,000	60.3%	1,420,200	56.9%	1,575,400	63.1%
7	n/a		13,100	0.5%	13,100	0.5%	13,100	0.5%
Total Acres	**207,900**		**2,497,700**		**2,497,700**		**2,497,700**	

* Some management areas overlap. When this overlap occurs the following hierarchy was used: MA1a, MA4, MA1b, MA1c, MA2, MA3, and MA7.

[1] Total for existing condition is MA11, which combines existing and recommended wilderness and primitive lands.

[2] Total for existing condition is MA12, which combines eligible and designated wild and scenic rivers.

[3] Total for existing condition is MA14, which combines research natural areas and experimental forests.

Table 6 summarizes the effects by alternative for each revision topic. Information in this table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively between alternatives

Table 6. Comparison of Resource Key Indicators for Revision Topics by Alternatives

Resource and indicator(s)	Alternative			
	A[1]	B Modified	C	D
Vegetation				
Forest composition	Least improvement	Second greatest improvement	Third greatest improvement	Greatest improvement
Forest structure	Least improvement	Greatest improvement	Second greatest improvement	Third greatest improvement
Landscape pattern	Least improvement	Greatest improvement	Second greatest improvement	Third greatest improvement
Susceptibility and resiliency to key disturbances	Least improvement	Greatest improvement	Third greatest improvement	Second greatest improvement
Carbon Sequestration	Greatest amount of carbon sequestered	Third highest amount of carbon sequestered	Second highest amount of carbon sequestered	Least amount of carbon sequestered
Fire				
Use of fire (natural, unplanned and planned ignitions)	Lowest emphasis	Second most emphasis	Most emphasis	Third most emphasis
Fuel treatment/risk reduction	Lowest emphasis	Most emphasis	Third most emphasis	Second most emphasis
Watersheds, Soils, Riparian and Aquatic Habitat/Species				
Trend in watershed condition, water quality, soil productivity, riparian ecosystem function, and quality of aquatic habitats	Overall improvements, based on current and historical accomplishments in restoration efforts and activities	More rapid improvement than C or D. Vegetation restoration emphasis, would likely target areas that include other active restoration	Potentially slower improvement, because of emphasis towards "passive restoration" with amount of land area allocated within MA1	Although more land allocated to MA6, compared to other alternatives, potentially slower improvement with the emphasis in commodity based management which

Resource and indicator(s)	Alternative			
	A[1]	B Modified	C	D
Vegetation				
		opportunities for soil and aquatic resources and includes a balance with passive restoration opportunities	– MA5	could offset effects of active and passive restoration efforts
Terrestrial Wildlife				
Changes in forest composition, structure, and pattern	See Vegetation section above	See Vegetation section above	See Vegetation section above	See Vegetation section above
Acres of security habitat	Least acres of security habitat	Second most acres of security habitat	Most acres of security habitat	Third most acres of security habitat
Access and Recreation				
Percent of the Forest where roads & trails may be designated for motor vehicle use	96 percent	91 percent	85 percent	91 percent
Percent of the Forest where over-snow vehicle use is allowed	82 percent	79 percent	74 percent	79 percent
Percent of the Forest where mechanized use is allowed	99.5 percent	93 percent	87 percent	94 percent
Percent of Forest by Scenic Integrity Objectives Categories				
Very High	7 percent[2]	7.6 percent	14.9 percent	7.6 percent
Very High/High	12 percent[3]	2.4 percent	1.5 percent	2.0 percent
High/Moderate	39 percent[4]	29.2 percent	26.9 percent	26.9 percent
High to Low	42 percent[5]	60.5 percent	56. 4 percent	63.2 percent
Low		0.3 percent	0.3 percent	0.3 percent
Percent of Forest by ROS Class				
Summer ROS:				
Primitive	1 percent	1 percent	1 percent	2 percent
Semi-primitive Non-motorized	6 percent	56 percent	58 percent	56 percent
Semi-Primitive Motorized/	16 percent	21 percent	20 percent	20 percent
Roaded Natural	73 percent	20 percent	19 percent	20 percent
Rural	4 percent	2 percent	2 percent	2 percent

Resource and indicator(s)	Alternative			
	A[1]	B Modified	C	D
Vegetation				
Winter ROS: Primitive Semi-primitive Non-motorized Semi-Primitive Motorized Roaded Natural/Rural Rural	1 percent 6 percent 16 percent 73 percent 4 percent	 1 percent 18 percent 67 percent 12 percent 2 percent	 1 percent 23 percent 62 percent 12 percent 2 percent	 2 percent 17 percent 67 percent 12 percent 2 percent
Recommended Wilderness				
Acres of recommended wilderness (includes overlapping MAs)	147,000 acres	161,400 acres	331,100 acres	138,100 acres
Timber				
Tentatively Suitable for Timber Production	2,076,900 acres	2,076,900 acres	2,076,900 acres	2,076,900 acres
Other resources limit timber or management precludes timber production as an objective	1,148,000 acres	1,126,000 acres	1,170,300 acres	1,092,500 acres
Suitable for Timber Production	928,900 acres	950,900 acres	906,500 acres	982,300 acres
Percent Suitable	37 percent	38 percent	36 percent	39 percent
Predicted Volume Sold	46.8 MMBF	44.6 MMBF	43.3 MMBF	46.3 MMBF
Allowable Sale Quantity (ASQ) Long-term Sustained Yield	124.9 MMBF 22.3 MMCF	120.3 MMBF 22.1 MMCF	115.9 MMBF 21.2 MMCF	131.3 MMBF 23.4 MMCF

[1] Alternative A (no-action) does not have Scenic Integrity Objectives established using the Scenery Management System. In 1987 when the original Plan was completed Scenery was described using the Visual Management System (Agriculture Handbook Number 462) with areas of the forest classified using Visual Quality Objectives (VQO).

[2] In the 1987 Plan this was the percent assigned to the “Preservation” VQO.

[3] In the 1987 Plan this was the percent assigned to the “Retention” VQO.

[4] In the 1987 Plan this was the percent assigned to the “Partial Retention” VQO.

[5] In the 1987 Plan this was the percent assigned to a “Modification and Maximum Modification” VQO.

Chapter 3. Affected Environment and Environmental Consequences

Introduction Organization of Chapter 3

Chapter 3 summarizes the physical, biological, social, and economic environments that may be affected by the alternatives presented in chapter 2. It also presents the effects that the alternatives may have on those resources. The discussion of affected environment and environmental consequences was combined into one chapter to provide a clear picture of what the resources are, and what could happen to them under the different alternatives. The analysis of environmental consequences provides the basis for the comparison of alternatives that appears at the end of chapter 2, table 6. This introduction provides the context in which the alternatives are analyzed.

Relationship between Programmatic and Site-Specific Analysis

This final EIS is a programmatic document. It discloses the environmental consequences on a large scale, at the planning level. This is in contrast to analyses for site-specific projects. The final EIS presents a programmatic action at a forest level of analysis but does not predict what will happen each time the standards and guidelines are implemented. Environmental consequences for individual, site-specific projects on the Forest are not described. The environmental effects of individual projects will depend on the implementation of each project, the environmental conditions at each project location, and the application of the standards and guidelines in each case.

The affected environment and environmental consequences discussions in this chapter allow a reasonable prediction of consequences for any individual location on the Forest. However, this document does not describe every environmental process or condition.

Budget Levels

The Forest's budget directly affects the level of activities and outputs that may occur as a result of forest plan implementation. Budgets are expected to remain flat or decrease in the future. The effects of all alternatives were analyzed using current budget levels. To analyze effects without consideration of expected budgets would be a misrepresentation of expected outcomes. The exception is the vegetation and timber resource sections. To display movement towards vegetation desired conditions and to develop the ASQ, an unconstrained budget level was analyzed along with the constrained, current budget level.

Affected Environment and Environmental Consequences Section

The remainder of chapter 3 is organized by resource, focusing on those resources related to issues described in chapter 1. Following the overview of the IPNF, the chapter is divided into four major sections:

- Physical and Biological Elements
- Uses and Designations of the Forest
- Production of Natural Resources
- Economic and Social Environment

Each resource section is further divided into the following sub-sections:

- Introduction
- Legal and Administrative Framework
- Analysis Area
- Analysis Methods and Assumptions
- Key Indicators
- Changes Between Draft and Final (where applicable)
- Affected Environment
- Environmental Consequences (direct, indirect, and cumulative effects)

Overview of the IPNF

Physical and Biological Environment

In order to provide a better understanding of the ecological setting and importance of the IPNF, one must first look at where the Forest is in relation to a larger landscape.

The IPNF were created in 1973 to administer the Coeur d'Alene, Kaniksu, and St. Joe National Forests, which encompass 2.5 million acres. The Forest administers lands in three states: Idaho, Montana, and Washington and have agreements with Canada and Mexico. Elevation on the Forest ranges from 2,100 to 7,600 feet with as much as 80 inches of precipitation at high elevations. There are approximately 400 species of wildlife, including wolves and grizzly bear. There are 73 fish species in the many streams and lakes.

The IPNF falls within various hierarchical land units such as the Northern Rocky Mountain Ecological Province, the Canadian Rocky Mountains Ecoregion, the Upper Columbia River Basin, and the Kootenai River Basin. Recent broad scale assessments, such as the ICBEMP, have been completed for each of these land units, which have included all or portions of the Forest. In addition, assessments have been completed or are ongoing for large portions of the Forest (geographic area assessments for the IPNF). These broad-scale assessments were reviewed and the resulting information incorporated into this analysis.

The IPNF are a large forest employing over 300 permanent employees working in all resource areas and hundreds more employed during the field season. The Forest houses a working tree nursery that provides planting stock of native plants for forests all over the west. Over 11,000 miles of classified roads exist in the Forest. There are 850,000 acres of inventoried roadless lands (48 areas totaling 34 percent of the land base) and a portion of one wilderness, the Salmo-Priest (11,950 acres) administered by the Colville National Forest. Four roadless areas are proposed for Wilderness: Salmo-Priest (Idaho portion), Selkirk Crest, Scotchman Peaks, and Mallard-Larkins (146,700 acres). Estimated forest growth is 400 million board feet annually on the suitable acres with over 100 million board feet of mortality on all acres annually.

Most of the IPNF are a moist forest type, influenced by maritime air masses riding the prevailing winds from the coast. The IPNF is a lakes region with Idaho's three largest lakes: Pend Oreille, Coeur d'Alene, and Priest. The lakes are very important for tourism and recreation in the region.

The IPNF are part of the Upper Columbia River Basin. The Forest has significant watersheds and water resource management is very important to the Forest. The Forest has one designated wild and scenic river, the St. Joe.

There is extensive trail use for stock, off-highway vehicle use, hiking, and winter snowmobile and cross-country skiing. The Forest is rich with backcountry trails in the Bitterroot, Selkirk, Purcel, Cabinet, and Coeur d'Alene mountains. The trailheads, day use areas, campgrounds, and dispersed sites close to town are at or near capacity on the weekends and more remote sites provide opportunities for solitude. Hunting and fishing are important to the region and outfitters and guides are very active on the Forest providing a variety of outdoor experiences.

The Forest is heavily influenced by urban populations. Spokane, an urban area of over 470,000 people, lies 30 miles to the west. The forestlands are present in many communities in the Panhandle and are part of community watersheds, provide recreation opportunities, and sometimes are needed for utilities, such as sewer expansion and communication sites.

Ecological Sustainability

Many of the decisions to be made in the Forest Plan will affect the Forests' contribution to ecological sustainability. Goals, desired future conditions, objectives, standards, guidelines, MA allocations, and monitoring will all have effects to the components of ecological sustainability.

Over the last half-century, scientists and natural resource managers have learned much about how ecosystems contribute to the fulfillment of human life (Costanza et al. 1997). An ecosystem is an interacting system of living organisms and their environment. Most obviously, ecosystems provide many of the goods that are harvested and traded in the human economy – food, timber, forage, biomass fuels, and many pharmaceuticals (Daily 1997). Ecosystems also provide indirect benefits to humans through their impacts on nutrient flux and cycling, mitigation of flood and drought, and maintenance of biodiversity, all of which feedback in important ways on the production of ecosystem goods that humans directly derive from ecosystems (Chapin et al. 1996). Finally, ecosystems also provide less tangible, but equally important, benefits in the form of recreational, spiritual, and intellectual stimulation (Postel and Carpenter 1997). Because of these important and necessary goods and benefits provided to humans, the long-term sustainability of ecosystems is central to natural resource management.

Ecological sustainability is defined as: "The ability to maintain diversity, productivity, resilience to stress, health, and yields of desired values, resource uses, products, or services over time in an ecosystem while maintaining its integrity" (USDA Forest Service 1995a). Integrity, in turn, is defined as: "…the capacity to support and maintain a balanced, integrated, and adaptive biological system having the full range of elements and processes expected in a region's natural habitat" (Karr 1991). Critical elements of integrity include vegetation measures of structure, composition, and process and they are defined as:

- Structure – the horizontal and vertical physical elements of forests and grasslands and the spatial interrelationships of ecosystems.
- Composition – the component tree, shrub, grass, and forb classes in a stand or community.
- Function – includes energy flows of materials across and within the landscape and how one ecosystem influences another. Function also relates to energy processes such as fire, hydrological processes (including floods), and matter and energy exchange throughout the food chain.

A system subject to external disturbance will retain its integrity if it preserves all its components as well as the functional relationships among the components (De Leo and Levin 1997).

Based on Haynes et al. (2001), a working definition of aquatic sustainability can be described as the inherent capability or existing potential for a watershed system to provide water quality, water bodies (streams, lakes, wetlands, ponds, etc.), riparian environs (wetlands, flood plains, stream banks, lake shores, and other lands including terrestrial lands proximal to water bodies that can directly influence the water), and the biologic organisms that live in or are dependent on the water that are necessary to support the beneficial uses of the water.

Ecosystem diversity is the variety of ecological structures, communities, and processes across spatial scales such as regions, sub-regions, landscapes, and localities. Ecosystem diversity arises from variation in abiotic and biotic components and ecological processes over space and time (Huston 1994). History plays a strong role in the ecosystems we see today through the long-term effects of geological and climate change and biological evolution, and the shorter-term effects of weather, disturbance, succession, and migration of organisms. Ecosystems are open, linked, and adaptive systems. Linkages among ecosystem components can be weak or strong and the system's responses to change in one component can be spatially and temporally lagged (Wu and Loucks 1995).

Social and Economic Environment

Issues related to socio-economic resources are analyzed in detail in this chapter. These resources include Recreation, Access, Wilderness, Wild and Scenic Rivers, Special Areas, Timber, Livestock Grazing, Minerals, and Tribal Rights and Interests. The chapter includes an analysis on the social and economic effects of these resources on the planning area. As part of Forest Plan revision, an assessment was completed on the conditions and trends of the social and economic setting for the IPNF (Russell et al. 2006). Following are excerpts from this document, giving a general description of the historical and socio-economic setting for the IPNF.

Historical Setting

The social and economic environment for the IPNF incorporates a geographic region including portions of eastern Washington State, the panhandle region of northern Idaho and parts of western Montana. The Canadian provinces of Alberta and British Columbia are across the international border with Washington, Idaho, and Montana. The states and provinces of this region are the historical homeland for Native American tribes including the Kalispel Tribe of Indians, the Kootenai Tribe of Idaho, the Coeur d'Alene Tribe of Idaho, the Confederated Salish and Kootenai Tribes, the Spokane Tribe of Indians, the Confederated Tribes of the Colville Reservation, and the Nez Perce Tribe. These tribes relied on the natural resources of these lands, including camas roots, salmon, elk, deer, and other fish, game, and plant material. After the acquisition of horses, some also trekked across the mountains to hunt buffalo. A lifestyle tied to following the natural cycles of resource production and availability characterized these tribes before contact with Europeans and Americans.

Fur traders and explorers, including David Thompson and others of the North West Company and Hudson's Bay Company, were among the first to make this contact. By 1809 David Thompson had established Kullyspell (Kalispell) House on Lake Pend Oreille. Other fur traders of the North West Company and Hudson's Bay Company were followed by Christian missionaries including the Jesuit Priest Father Peter DeSmet who established one of the first missions in what was to become northern Idaho. In 1805-1806, as Lewis and Clark descended from Lolo Pass, they were greeted by members of the Nez Perce Tribe. Tribal members assisted them with horses, food, and travel through their territory. Lewis and Clark took back to the east stories about the resources of this region, stimulating further exploration and a trickle of new settlers who were seeking to use and develop the resources of the region.

Gold was found along Libby Creek in northwestern Montana about 1860. Around this same time (1863) gold was discovered in British Columbia attracting miners who traveled along the Wild Horse trail and across the Kootenai River, aided by Bonner’s ferry. The discovery of gold, silver, zinc and other metals south of the Canadian border attracted a new influx of miners, cattlemen, farmers, and entrepreneurs into this region. Mining flourished in communities such as Kellogg and Pierce in Idaho as well as in western Montana. Development of the region was further fueled by construction of the Northern Pacific Railroad and Great Northern Railroad during the 1880s and 1890s. During this same time period (1890) Forest Reserves were created in this part of Idaho and Montana and these eventually became NFS lands.

The open spaces, rich natural resources, and scenic beauty aided by the Homestead Act of 1909 continued to fuel growth in the region. Once the railroad provided adequate transportation, timber resources also became an important source of economic and population growth. White pine, fir, and other timber resources attracted lumber interests from the east that established mills and company towns such as Potlatch in Idaho. The first farmers arrived in the region around 1869 growing flax and other grains. They were attracted by the fertile ground in the rolling hills and grass lands of north central Idaho’s prairie lands. These first farmers provided the food resources for the mill towns, miners, and shop keepers who were essential to the development of the entire region.

The history of this region is steeped in logging, mining, agriculture, and the railroad connecting the east to the west. These railroads were essential to enabling development of the region’s resources. The present day socioeconomic environment of the project area has a foundation in this history of natural resource development and settlement driven by the economics and lifestyle issues of western exploration that was supported by the federal government policies such as the Homestead Act.

Social Setting

National forests are public lands that influence and are influenced by the local and national public. The local public is represented in the communities of place and interest adjacent to national forest lands. Many of these communities were formed from the development of timber, gold, silver, grazing lands, and other natural resources. Historically, individuals in these communities developed strong place attachments to public lands that provided recreational, aesthetic, employment, and other contributions to their social environment. Work, place, and lifestyles became an integral part of the culture and social characteristics of such communities. These communities developed particular interests in the interactions of public lands with their ways of life and their economic present and future. These interests are expressed in their interactions with public lands in addition to the actions and comments of local interest groups.

The IPNF contains portions of ten counties in three states: Benewah, Bonner, Boundary, Clearwater, Kootenai, Latah, and Shoshone counties in Idaho; Lincoln and Sanders counties in Montana; and Pend Oreille County in Washington. The analysis area for the social and economic environment is comprised of the counties that are influenced by IPNF management and, when grouped, create a functional economy. Benewah, Bonner, Boundary, Kootenai, and Shoshone counties comprise the analysis area for the IPNF. These are the counties that are likely to be affected by IPNF management. These counties are also influenced by a larger regional economy comprised of the surrounding counties.

Within this larger region, several different categories of communities can be identified by characteristics such as population size, patterns of residence, and lifestyles. Spokane (population of 471,000 persons) and Missoula (60,722) are *regional centers* with larger populations, more dense urban-like residence patterns, and access to airports that connect to larger transportation hubs. Similarly, Spokane and Missoula also offer access to diverse specialty services as well as diverse shopping and amenities. A second community grouping is the *regional hub* that provides services, shopping, amenities, and employment opportunities for residents of nearby smaller communities and rural residents, although not the diversity of services and amenities offered in the regional centers. These communities are the next largest in population size and they also have urban-like residence patterns and population densities. Regional hub communities include Kalispell (16,391), Sandpoint (7,378), Coeur d'Alene (37,262), Moscow (21,707), and, Lewiston (30,937). *Rural centers* are the third community category. Rural centers may be a county seat or other incorporated entity offering basic services and amenities for nearby smaller communities and rural residents. Places such as Libby (2,606), Thompson Falls (1,323), St. Maries (2,589), Kellogg (2,236), and Bonner's Ferry (2,647) exemplify these rural centers. *Rural towns* provide limited services and amenities, but they foster a sense of local identity and community among those living in their vicinity. These rural towns are exemplified in communities such as Moyie Springs (685) in Boundary County, Clark Fork (566) and Priest River (1,863) in Bonner County, Harrison (984) in Kootenai County, Wallace (887) in Shoshone County, Potlatch (759) in Latah County, Troy (957) and Eureka (1,017) in Lincoln County, and Plains (1,126) in Sanders County.

Traditionally, the county communities relied on the use of natural resources in activities such as farming, ranching, mining, and timber production. Recreation has also been an important use of forest resources among the residents of nearby communities as well as others from more distant urban areas such as Spokane, Missoula, and elsewhere. Recreation usage also appears to be increasing as urban populations increase and more diverse residents are moving to rural towns and cities. The institution of the Forest Service has also been a part of the social environment of communities in this region since development of the NFS.

Physical and Biological

This section includes the following resources:

- Vegetation
- Rare Plants
- Non-native Invasive Plants
- Fire and Fuels Management
- Watershed, Soils, Riparian, Aquatic Habitat, and Aquatic Species
- Terrestrial Wildlife
- Air Quality

Vegetation is listed first as it is often referred to in several of the following sections

Forest Vegetation

Introduction

The ecosystems and vegetation of the IPNF are dynamic. The processes of succession and disturbance patterns have produced the current vegetativon conditions. These natural processes, both part of and necessary for ecosystem function, will continue to produce changes in the future. Therefore, the following descriptions of current vegetation represent only one point in time. Some of the changes will be generally predictable, others less so. Accordingly, any description of future vegetation is a prediction subject to uncertainty. The level of uncertainty depends on the degree to which natural processes are allowed to operate. Natural disturbance events such as fire, windstorms, landslides, and insect and disease outbreaks are generally difficult to predict. On the other hand, changes associated with succession and human-caused disturbance such as timber harvest and prescribed burning are fairly predictable. Although the Forest will experience natural disturbance events, the degree to which they are allowed to occur will influence the ability to predict future vegetation conditions at any given point in time.

Legal and Administrative Framework

Law and Executive Orders

- **The Forest and Rangelands Renewable Resources Planning Act of 1974:** Provides for maintenance of land productivity and the need to protect and improve the soil and water resources.
- **The National Forest Management Act (NFMA) of 1976:** "It is the policy of the Congress that all forested lands in the NFS shall be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth and conditions of stand designed to secure the maximum benefits of multiple use sustained yield. Plans developed shall provide for the diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet the overall multiple-use objectives, and within the multiple-use objective."
- **Federal Noxious Weed Act of 1974:** Authorizes the Secretary to cooperate with other federal and state agencies and individuals in carrying out measures to eradicate, suppress, control, or prevent the spread of noxious weeds.
- **The Endangered Species Act (ESA) of 1973:** Requires federal agencies to conserve threatened and endangered species.
- **Executive Order 13112:** Directs federal agencies whose actions may affect the status of invasive species to (1) prevent the introduction of invasive species, (2) detect and respond rapidly to and control populations of such species in a cost effective and environmentally sound manner, as appropriations allow.

Regulation and Policy

- **FSM 2080:** Contains numerous provisions related to suppression of noxious weeds.
- **FSM 4063:** Directs management of Research Natural Areas as part of a national network of ecological areas allocated in perpetuity for research and education and/or to maintain biological diversity on NFS lands.
- **FSM 4063.03:** Forest Plans shall include analysis of, and recommendations for, any proposed research natural areas establishment.

- **FSM 2670.22:** (1) Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions; (2) maintain viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands; (3) Develop and implement management objectives for populations and or habitats of sensitive species.
- **Departmental Regulation 9500-4:** Habitats for all native and desired non-native plants, fish, and wildlife species will be managed to maintain at least viable populations of such species. In achieving this objective, habitat must be provided for the number and distribution of reproductive individuals to ensure continued existence of a species throughout its geographic range.
- **Region 1 Natural Areas Assessment 1996:** Provided an assessment of plant community types needed to fulfill the national spectrum of types to be placed in RNA status in Region 1.
- **USDA Forest Service Position Statement on National Forest Old-Growth Values 10/11/89:** Recognizes the many values associated with old growth forests, such as biological diversity, wildlife and fisheries habitat, recreation, aesthetics, soil productivity, water quality, and industrial raw material. Old growth on the national forests will be managed to provide the foregoing values for present and future generations. Decisions on managing existing old growth forest to provide these values will be made in the development and implementation of forest plans. These plans shall also provide for a succession of young forests into old growth forests in light of their depletion due to natural events or harvest.

Key Indicators

- Forest composition and structure – predicted changes to tree species composition and structure (tree size classes, old growth, and snags);
- Landscape pattern of the forest – potential changes to the patterns of forest conditions (e.g., successional stages, species composition, tree density, and fuels) on the landscape;
- Resistance and resiliency of the forest vegetation to disturbances and stressors – effects of the alternatives on the hazard of wildfire, key insects, and diseases, weather disturbances, and climate change; and
- Carbon sequestration.

Methodology and Analysis Process

The vegetation management approach that is being used in the Forest Plan is one of providing ecological components, patterns and processes at multiple scales on the landscape, and thereby providing the full spectrum of habitats and conditions needed for all of the biological organisms associated with the various ecosystems. This general strategy is often called the “coarse-filter” approach to ecosystem management and is followed by a fine-filter approach that focuses on more species-specific management strategies (see AMS Technical Report (2003) for more detailed information). In order to preserve species, their populations, genetic structure, biotic communities, and landscapes, there has been an increased emphasis on the maintenance of ecological functions, processes, and disturbance regimes (West and Whitford 1995).

As a way to understand the various ecosystems on the Forest and sustain the biodiversity within them, it is necessary to have some reference for understanding the potential productivity of the land, the natural diversity of the relevant ecosystems, and what processes sustain this productivity and diversity. The concept of ecosystem ranges of variability has been suggested as a framework for coarse filter analysis (Landres et al. 1999). Historic range of variability concepts were developed in part to better understand how disturbance, vegetation, and other ecosystem components interact, and in turn how interaction affects biophysical characteristics such as plants, animals, fish, and soil and water resources. Historical perspectives increase our understanding of the dynamic nature of landscapes and provide a frame of reference for assessing current patterns and processes (Swetnam et al. 1999).

The HRV analysis focuses on forest composition, structure, landscape pattern, and processes (disturbance and succession). Not only was the HRV considered in revising forest plan direction, but the potential impacts that climate change might have on the future range of variability was contemplated. The concept of comparing current vegetation conditions to both the historical as well as the potential future conditions is described by Gärtner et al. (2008). In summary, this approach is designed to provide insights into how ecosystems have changed, as well as how they may change in the future. The knowledge gained from this approach can then be used to “inform” management decisions regarding how climate change may affect future landscape conditions (Keane et al. 2008). Given these insights, climate change adaptive strategies such as fostering “resistance” and “resiliency” in the forest ecosystems can be considered.

Historic and Desired Conditions

A historic range of variability (HRV) was developed to determine historic conditions and provide context for building the vegetation desired conditions for the Forest Plan. The Technical Report for the AMS for the KIPZ Forest Plan Revisions (March 2003) contained preliminary information on HRV for the IPNF. This report defined the HRV as the range of variation in spatial, structural, compositional, and temporal characteristics of ecosystem elements as affected by minor climatic fluctuations and disturbances. This range is measured using a reference period prior to intensive resource use and management. For the IPNF, this period is considered to be approximately 2,500 years ago up until 1880 (Chatters and Leavell 1994). The HRV is the baseline for comparison with current conditions to assess the degree of past change.

To complete the HRV and analyze current conditions, the KIPZ chose the following three ecosystem characteristics to quantify and describe:

- Composition (Dominance type or species composition)
- Structure (Size class)
- Landscape pattern (Fragmentation)

Historic ranges for dominance type and size class were developed at both the forestwide scale as well as for each of the three biophysical settings. Landscape pattern was assessed by geographic area and at the forestwide scale.

The HRV analysis used a wide variety of sources and methods to assess historic conditions, including:

- Information about post-glacial (last 11,00 years – Holocene Era) climate and vegetation changes to set context for more recent conditions;
- Narrative descriptions from the early expeditions (Stevens Expedition during 1853-55 and Mullan Road Journals for 1859-61);
- Data, maps, and narrative descriptions from the 1890s contained in government surveys done in conjunction with the establishment of the Forest Reserves (Leiberg's reports 1897);

- Data, maps, and narrative descriptions from numerous Timber and/or Forest Management Plans done on most proclaimed national forests on approximately a decadal basis from 1910' through the 1960s;
- 1930s reports on forest conditions by county;
- John Losensky's 1993 report: Historical Vegetation in Region 1 by Climatic Section;
- Data from various Region 1 reports on timber conditions on national forests during the first half of the 20th century;
- Information on fire return intervals from fire history investigations in these ecosystems;
- Historical accounts of the 1910 and other fires;
- Maps of large fires dating from approximately 1880s through the 1970s;
- Extensive sets of aerial photos from the 1930s;
- Modeling results using the VDDT Model done as part of information development for the Interior Columbia River Basin Assessment (this transition model predicts vegetation condition over time using information about successional and disturbance processes);
- Historical and vegetation change information from the late 1990s Interior Columbia River Basin Assessment;
- Change information from the 1998 Forest Service, Northern Region Overview;
- Pollen, sediment, and charcoal analysis (Chatters and Leavell 1994); and
- Negative exponential model for age classes.

A variety of historic data and information sources was assessed and compared to avoid omissions and biases that may be inherent in any one source. Trends through time from one data source to another were examined to uncover any information that may be in contradiction to the preponderance of evidence. Information in both narratives and historical forest inventories was also compared to objective evidence such as historic landscape scale photos, historical records and maps of major forest fires, and various fire history studies. Findings from the Interior Columbia River Basin Assessment, the US Forest Service Northern Region Overview (USDA Forest Service 1998), and model (negative exponential model) results were also included in the analysis.

Development of HRV was an iterative process, involving teams of specialists from the districts and supervisor’s offices, including silviculturists, ecologists, timber managers, wildlife biologists, and fire managers with extensive field knowledge. These specialists reviewed the historic and current information to develop historic conditions for their study area.

In addition, two parametric fire history models (the negative exponential and the Weibull models) were used to develop theoretical age class distributions. These models were tailored for forest fire regimes and diversity. These outputs were reviewed and adjusted based on data from existing stands (analysis of age class and structure) and an understanding of historic disturbance effects.

The resulting HRV was then reviewed in the context of climate change. Results from HRV were found to be consistent with conditions that would improve resistance and resiliency under climate change. This resulted in the ranges for vegetation desired conditions by species and size class presented in the revised Forest Plan. Because it will take many decades to achieve these desired ranges, the desired condition for vegetation is to move towards these ranges.

Forest Vegetation Condition

The composition and structure of the forest vegetation was assessed using two primary sources of data: a spatial map source developed from remote sensing and an inventory source.

The spatial map source used in analysis of vegetation was the Northern Region Vegetation Mapping Project (R1-VMP). This mapping project was completed for the Northern Region of the Forest Service in April 2004, and provides a geospatial database of vegetation and land covers (Brewer et al. 2004, Brewer et al. 2006). These datasets were produced following consistent analytical logic and methods and mapped continuously across all ownerships. From this, four GIS layers were produced:

- Lifeform
- Tree Dominance Type
- Tree Diameter Class
- Tree Canopy Cover Class

The inventory source used in analysis was data from the forest inventory and analysis. The Forest Inventory and Analysis (FIA) program provides a congressionally mandated, statistically based, continuous inventory of the forest resources of the United States. Since 1930, the FIA program has been administered through the Research and Development branch of the Forest Service, which makes it administratively independent from the NFS. The FIA program is administered by employees of the Interior West Forest Inventory and Analysis work unit, which is headquartered at the Forest Service Rocky Mountain Research Station in Ogden, Utah.

The FIA program collects, analyzes, and reports information on the status and trends of America's forests (i.e., how much forest exists, where it exists, who owns it, and how it is changing), providing data related to the changing conditions of trees, and other forest vegetation. The FIA program combines this information with related data on insects, diseases, and other types of forest damages and stressors to assess the health and potential future risks to forests. The FIA program also projects these trends through the next 50 years and displays how various management scenarios would affect forest vegetation through time. Additional information on the FIA program can be found on the internet (http://www.fia.fs.fed.us).

The FIA data used for forest planning was collected from 1999 to 2002 on the IPNF. The FIA data was used to quantify both species and size class at the forest and biophysical setting scales. The FIA data was also used to develop growth and yield tables for the vegetation modeling.

Analysis Area

The affected area for direct and indirect effects to terrestrial vegetation is the lands administered by the IPNF. This area represents the NFS lands where changes may occur to vegetation as a result of management activities or natural events.

The affected area for cumulative effects to terrestrial vegetation includes the lands administered by the IPNF, as well as the lands of other ownership, both within and adjacent to the IPNF boundaries.

Changes between Draft and Final

Modifications to plan components related to old growth:

- Modifications were made to several of the plan components associated with the old growth resource. Additions were made to FW-DC-VEG-03 to express the desire that old growth stands be well distributed across the various geographic areas on the Forest and that old growth stands (or groups of contiguous stands) increase in size. Additional information on these items has been added to the old growth section in this FEIS. The phrase "other lands managed for old growth" was removed from FW-DC-VEG-03 because it was not needed in order to express the desire that the amount of old growth increase on the Forest. The response to Public Comment 359 in appendix G of the FEIS contains more information on the rationale for that change.
- A modification was made to both FW-STD-VEG-01 and FW-GDL-VEG-01 to eliminate the word "minimum." The underlying intent of those plan components is to allow some vegetation management activities within some old growth stands under certain conditions as long as the activities would not modify the stand to the extent that it would no longer meet the definition of old growth. Examples of the circumstances in which the Forest would consider proposing vegetation management activities in old growth stands has been added to the old growth section in this FEIS.

Additional information provided concerning old growth:

- Additional information and results of analysis for old growth were included in both the affected environment and environmental consequences sections of this FEIS. The quantitative estimates of existing old growth and potential future old growth were updated as a result of newer analysis. This additional old growth information was provided in order to address the numerous public comments that were received on the topic. Some of the additional information that was added to this FEIS was contained in the specialist report for forest vegetation at the time the draft Forest Plan and DEIS were released to the public, and some was developed since the drafts were released. For details on the comments that we received that prompted the expansion of this discussion, see Public Comments 351, 371, 960-962, 964 and 965 in appendix G of this FEIS.

Adjustments made to model simulations:

- As described in more detail in appendix B of this FEIS, between the development of the draft and final EIS the forest vegetation simulations that were made using the SIMPPLLE and Spectrum models were modified. There were a number of reasons for re-running those models but the two primary motives were to simulate the possible warming and drying influence from potential climate change impacts, and to correct deficiencies that were identified in the wildfire behavior, fire suppression, and insect/disease related elements of the previous SIMPPLLE modeling effort. As a result of re-running the models, the quantitative estimates of how the forest vegetation would change in the future for each alternative changed. Therefore, many of the numbers presented in the environmental consequences section of the FEIS related to forest vegetation have changed.

Additional information provided regarding western white pine and the tree improvement and reforestation program:

- As mentioned in a number of places in the revised Forest Plan and this EIS, restoration efforts for the western white pine are an extremely important component of the broader program to trend the forest vegetation on the IPNF towards a condition that is more resistant and resilient towards natural and man-caused disturbances and stressors. One part of the program to increase the dominance of this tree species in the Forest is the tree improvement and planting activities that are designed to increase the level of resistance that the white pine have against the non-native blister rust disease. The DEIS contained some information on this topic. However, in reviewing the public comments regarding this issue (e.g., Public Comment 354 and 362 in appendix G) it was apparent that providing additional information would be helpful for some readers to understand the necessity of the program and the genetic implications.

Expanded discussion regarding the desired future condition for forest vegetation:

- The IPNF received a number of public comments on the draft Plan/EIS that expressed concerns regarding the use of the historic range of variability (HRV) information in the development of the desired future conditions for forest vegetation. In general, those comments were responded to in appendix G (see the responses to Public Comment 952). However, additional information was also provided in this FEIS under the heading of “Forest Composition.”

Affected Environment (Existing Condition)

Forest Succession

Prior to presenting the existing, historical, and desired conditions for forest vegetation, it is helpful to have a general understanding of some of the important factors that affect the composition, structure, patterns, and ecological processes that occur in forest communities on the IPNF.

Processes and conditions that occur in vegetation communities are a result of interactions between the biological and physical environments in which they occur, as well as the history of natural and human-caused disturbances. To classify forest vegetation according to physical and environmental factors, a classification system called habitat typing was created. Habitat types are based on natural relationships and reflect ecological patterns and the capability of vegetation on a site.

The designation of habitat types and the classification of forest stands were established to characterize vegetation based on potential “climax” conditions (Cooper et al. 1991). Climax conditions represent the culmination of overstory and understory plant succession without disturbance. Because climax species, by definition, are those species that are self-perpetuating in the absence of disturbance, and because disturbances are relatively common on most sites, the occurrence of climax conditions is rare (Cooper et al. 1991).

In various sections of this FEIS, the terms succession and seral stages are used. Succession can be defined as the sequential process of long-term plant community change and development that occurs following a disturbance. Succession causes changes in forest composition, structure, and function. For example, following a stand-replacing wildfire a site may be dominated by grasses and herbaceous plants for a few years; then be dominated by shrubs for a decade or two; then be dominated by tree species that need open sunlight to regenerate (e.g., western larch, ponderosa pine, western white pine); and ultimately (if there's no new disturbance) be dominated by slower growing tree species that can regenerate in the shade (e.g., grand fir, hemlock, cedar). However, in complex ecosystems such as the forests on the IPNF, there are multiple successional pathways possible for any given site, depending upon the type of disturbance and the conditions when the disturbance occurs. For example, on forest sites that are warm/moist (also known as the cedar-hemlock zone), Shiplett and Neuenschwander (1994) describe five idealized successional chronologies based solely on the influence that fire disturbances have on the successional pathways. As described and visually depicted by Smith and Fischer (1997), these successional pathways can be very complex; even when they only include the consideration of one disturbance factor such as fire. When other disturbance factors are considered such as insects, disease and weather, the possible pathways become even more numerous and complex.

The different stages of succession are often referred to as seral stages and can be described as follows:

- **Early- seral:** Communities that occur early in the successional path and generally have less complex structural developmental than other successional communities. Stands dominated by trees in the seedling/sapling to small size classes are typically in this early seral stage.
- **Mid-seral:** Communities that occur in the middle of the successional path. For forests, this usually corresponds to stands that are dominated by trees in the small-medium size classes.
- **Late-seral:** Communities that occur in the later stage of the successional path with mature, generally larger individuals. Generally, stands in this late-seral stage will be dominated by trees in the large size class.

Biophysical Setting

To characterize the existing, historical, and desired forest vegetation across the IPNF, three Biophysical Settings were recognized: Warm/Dry; Warm/Moist; and Subalpine.

- **Warm/Dry**: This biophysical setting includes the warmest and driest sites that support forest vegetation. These sites cover approximately 15 percent of IPNF NFS lands and occur either at low elevations, at mid-elevations on southerly aspects, or on droughty soils. Vegetation response units 1 through 3 occur in this setting.
- **Warm/Moist**: This biophysical setting includes moist sites that are relatively warm and these sites cover approximately 61 percent of IPNF NFS forested lands. This setting includes low-elevation upland sites with deeper soils on north and east aspects, extensive mid-elevation moist upland sites, and most low- and mid-elevation wet stream bottoms and riparian benches and toe-slopes. Vegetation response units 4 through 6 occur in this setting.
- **Subalpine**: This biophysical setting occurs over approximately 24 percent of IPNF NFS forested lands and occupies the higher elevations of the Forest. This setting ranges from the cool and moist, lower subalpine sites up to the cold and dry, high elevation sites that have more open forests and occur between forest and alpine tundra. The moist end of this setting is common on northwest to east-facing slopes and riparian and poorly drained subalpine sites. The cool to cold dry sites occur at higher elevations and typically have a short growing season. Vegetation response units 7 through 11 comprise this setting.

These biophysical settings are broad groupings of vegetation response units that have been aggregated by factors that regulate disturbance regimes and successional responses (such as habitat types, landform, and other topographic characteristics, such as aspect); combined with climatic factors such as temperature and moisture gradients. The vegetation response units are equivalent to the land unit, or ecological land unit, as described in the National Hierarchical Framework of Ecological Units (Cleland et al. 1997). A comprehensive discussion of each of the individual vegetation response units, and a discussion of the methodology used to delineate them is presented in USDA Forest Service (1999).

Areas within each of the biophysical setting have similar patterns in potential natural communities, soils, hydrologic function, landform and topography, lithology, climate, and natural processes (e.g., nutrient and biomass cycling, succession, productivity, and fire regimes). Biophysical settings on the IPNF are displayed in figure 6.

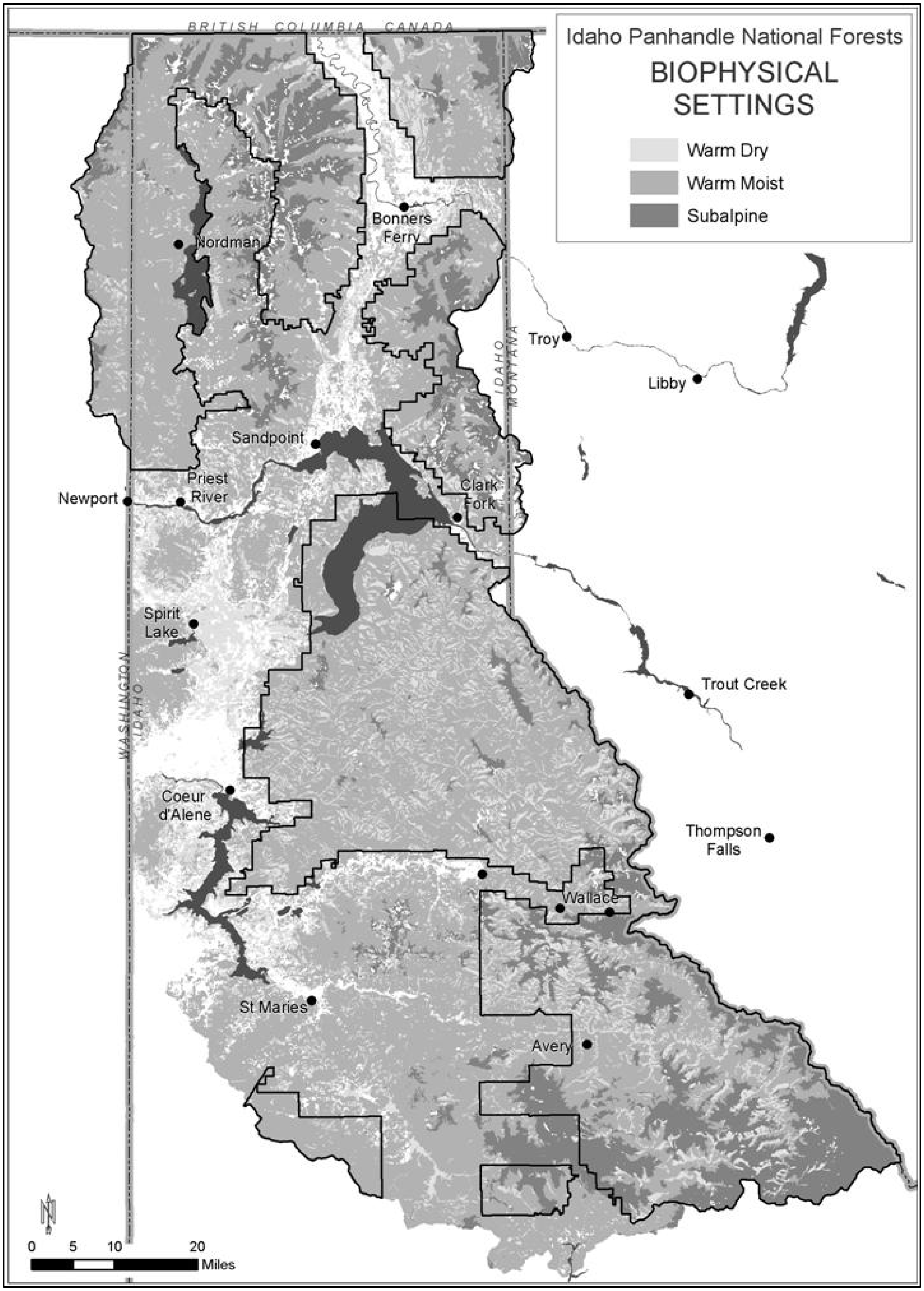


Figure 6. Map of the three Biophysical Settings on the IPNF

Disturbance Types and Processes

The AMS Technical Report described the historic and current disturbance processes (pages 3 to 7). Disturbance processes include the following: climate; weather; wildfire; management activities of timber harvest and prescribed burning; and insects and disease. These disturbance processes have a great influence on vegetation composition and function. The following information is generally in addition to what is included in the AMS Technical Report on this topic.

Climate

The climate within the Interior Columbia River Basin, which includes the IPNF, is particularly dynamic because it has a transition-type climate, which is influenced by three competing air masses:

1. Moist, marine air from the west that moderates seasonal temperatures;

2. Continental air from the east and south, which is dry and cold in the winter and hot with convective precipitation and lightning in summer; and

3. Dry, artic air from the north that brings cold air in winter and helps cool the area in summer.

The relative strengths of these air masses can vary greatly over time, change rapidly, and are controlled by large-scale weather patterns, including the position of the jet stream and continental-scale patterns of high and low pressure systems. Northeastern Washington and northern Idaho is an area where the variability caused by the interaction of these three air masses is great (Ferguson 1999).

Because of the strong influence of inland marine airflow, precipitation in northern Idaho and northwest Montana is generally heavy compared to the rest of the Rocky Mountains. However, precipitation tends to vary on a decadal basis, with wet periods and dry periods each lasting several years to decades (Finklin and Fischer 1987). Extended droughts raise the fire danger and stress trees, especially the more drought intolerant species. During drought times, these stressed trees are less able to resist insect and pathogen attacks. Recent research has found evidence that decadal scale fluctuations in climate, such as those caused by the Pacific decadal oscillation, can have a large influence on forest disturbance processes such as wildfires and insect outbreaks (Bollenbacher 2010, Hessl et al. 2004, McKenzie et al. 2009, Morgan et al. 2008, Westerling et al. 2006). This climatic variability creates an environment prone to a high frequency of a variety of disturbances. Rocky Mountain forest ecosystems are (and were historically) a mosaic of disturbance-derived patches of various ages and composition. Historically, fire was the primary disturbance agent throughout most Rocky Mountain ecosystems (Barbour and Billings 2000 or Peet 2000), but insects, pathogens, and weather events were also important.

An assessment on climate change for the planning zone synthesized the most recent scientific information regarding how future climate change may impact forest resources and disturbance processes on the IPNF and KNF (USDA Forest Service 2010b). The report concluded the average annual temperatures will increase 2.2°F by the 2020s and 3.5°F by the mid-21st century. The greatest temperature increases are predicted for the summer season. Precipitation predictions are considered less certain, but most of the climate change models project decreases in summer precipitation, increases in winter, and little change in the average. It is also predicted that some extreme events will occur more frequently or with greater magnitude, while others may be less frequent (i.e., more unusually warm periods and fewer really cold spells). Other research for the northern Rockies (Westerling et al. 2006, Running 2006, Morgan et al. 2008) predicts warmer springs, earlier snowmelt, and hotter, drier summers with longer fire seasons and larger, more intense fires.

Weather

The weather of the IPNF is unique to the inland area of the western United States. Strong maritime air flow carries high levels of moisture to this area. Moist maritime air that moves across the Northwest carries significant moisture descending from the Cascade Mountains and across the Columbia Plateau. When this warm/moist air is driven into the IPNF heavy/wet snows can occur. These storms often result in significant windthrow and breakage in species of trees such as Douglas-fir, western hemlock, and grand fir, especially when the ground is not frozen. The narrower crowns of western white pine, the deep rooting habits of ponderosa pine, and the deciduous nature of western larch make them less susceptible to this damage. Root diseases make Douglas-fir especially vulnerable to windthrow events. Dense stands, where tree canopies form contiguous “interlocking” tree crowns and trees tend to be relatively tall and have small diameters, are especially susceptible to damage from heavy snows and/or winds. This can lead to heavy fuel loadings for decades afterwards.

In general, weather events raise the probability of subsequent insect or fire disturbances. Trees broken or blown down in severe weather events provide breeding grounds for some bark beetle species. Weather events that cause large amounts of tree breakage or blowdown are frequently the precipitating event that leads to bark beetle epidemics. In turn, blowdown from weather events and trees killed by insects both create woody fuels that increase fire hazard (USDA Forest Service 2000b).

In the northern Rocky Mountains, precipitation tends to vary on a decadal basis, with wet periods and dry periods each lasting several years to decades (Finklin 1983). Extended droughts both raise the fire danger and stress trees, especially the more drought-intolerant species. Western hemlock and grand fir are two of the more drought-intolerant tree species on the IPNF, and are highly stressed during drought periods. In an ecosystem subject to periodic droughts, the succession to these shade-tolerant, drought- and fire-intolerant forest types creates an increased risk of large-scale insect and disease mortality. During droughts these stressed trees are less able to resist insect and pathogen attacks. This climatic variability creates an environment prone to a high frequency and variety of disturbances.

Wildfire

The dominant, historical fire regime that occurred within forested vegetation on the IPNF can be characterized as a variable or mixed-severity fire regime (Brown and Smith 2000, Kilgore 1981, Zack and Morgan 1994). This type of fire regime commonly had a moderately short fire return interval for nonlethal or mixed-severity fires, with lethal crown fires occurring less often. Relative to the other two common fire regimes (i.e., non-lethal and stand-replacement regimes) that are often recognized for forested vegetation, the mixed-severity fire regime is the most complex (Agee 2004, Perry et al. 2011). Individual mixed-severity fires typically leave a patchy pattern of mortality on the landscape, which can create highly diverse communities. These fires kill a large percentage of the more fire-susceptible tree species (e.g., hemlock, grand fir, subalpine fir, lodgepole pine) and a smaller proportion of the fire-resistant species, including western larch, ponderosa pine, whitebark pine, and western white pine (Arno et al. 2000, Arno 1980). Across the Northern Rockies (Idaho and western Montana), areas that were characterized as having a mixed-severity fire regime affected approximately 50 percent of the area within national forests, while the non-lethal regime (also known as low-severity regime) affected approximately 30 percent, and the lethal fire regime (also known as the stand-replacement regime) approximately 20 percent (Quigley et al. 1996). The three fire severity types that occur in this mixed-severity regime are briefly discussed below.

Stand-replacing (lethal) fires are those that result in killing most of overstory tree canopy over a significant area and restarting the successional sequence. Historically, on landscapes dominated by relatively moist habitat types (e.g., those habitat types that dominate the warm/moist biophysical setting), the mean fire return interval was approximately 200 years for stand-replacing fires (plus or minus 80 years), with slightly drier sites burning more frequently and wetter sites burning less frequently (Leavell 2000, Smith and Fischer 1997, Zack and Morgan 1994). The fire-adapted, shade-intolerant tree species in these ecosystems commonly live 140 to 400 plus years. Because the historic mean, stand-replacing fire return interval was shorter than the life-span of many shade-intolerant, early successional tree species, these fire regimes trended forest succession towards dominance by fire-adapted, shade-intolerant, potentially long-lived early-seral tree species (ponderosa pine, larch, white pine, and whitebark pine), as well as towards fire-adapted plant species in the shrub and herb lifeform layers.

Major fire years occur most commonly during regional summer droughts. Lightning storms and wind contribute to the likelihood of a major fire year. During major fire years, stand-replacing fires were commonly on the order of tens of thousands of acres, with some individual fire patches 50,000 acres or larger (Pyne 1982, Zack and Morgan 1994). During major fire events some watersheds were almost entirely burned over, while other large areas were unaffected. In any particular watershed, major stand-replacing disturbances came in pulses with long intervals between the pulses. During the last 100 years, these pulses were synchronized with the occurrence of the warm phases of the Pacific decadal oscillation, and the result was hot and dry local weather (Morgan et al. 2008).

While stand-replacing fires in the Northern Rockies favor long-term dominance by early successional, shade-intolerant tree species, the mean time interval between stand-replacing fires was long enough to allow development of mature and old growth forest structural stages, particularly in locations where fire intervals tended to be longest; for example, in wide riparian zones, moist flats, north slope coves and benches, and the lower portions of north slopes (Zack and Morgan 1994).

Mixed-severity fires kill a moderate amount of the overstory tree canopy, but do not replace the whole stand. Mean fire return intervals typically ranged from 55 to 85 years, depending upon landscape location. On very moist sites they may have been significantly less common, while on drier sites return intervals were 25 years or less (Smith and Fischer 1997, Zack and Morgan 1994). Mixed-severity fires create an irregular patchy mosaic of small- to moderate-sized openings, thinned areas, underburned areas, and unburned areas. Mixed-severity fires generally prolonged the period of dominance by early successional fire-adapted species and at a larger scale, allowed for the development of mature and old growth structural stages dominated by large trees. A classic example of this is the influence that periodic low- to moderate-severity wildfires had on releasing western larch from competing, shade-tolerant tree species. The periodic thinning effect that this had on stands of old growth larch at the Coram experimental forest allowed for this early seral species to be maintained in the forest (Elzinga and Shearer 1997). Fire also played many additional ecological roles as a carbon and nutrient recycling agent, dormancy breaking and stimulating agent for herb and shrub seeds and sprouts, and creator of tree cavities and snags (used by wildlife). Historically, mixed-severity fires were extremely variable in size (less than one acre to more than 1,000 acres) and introduced both variable-sized patches and internal diversity within larger blocks created by the less frequent stand-replacing fires (Zack and Morgan 1994).

Low-severity (nonlethal) fires are typically underburns that kill very little of the overstory tree canopy. They are most important on drier habitat types where conditions are dry enough to burn more frequently; for example, within the warm/dry biophysical setting). Mean fire return intervals typically range from 10 to 30 years (Smith and Fischer 1997). Low-severity fires typically remove most small understory trees, particularly the more shade-tolerant, fire-intolerant species. On drier habitat types where these fires are common, the frequent burns maintain a large portion of the landscape in relatively open stands of large, shade-intolerant, fire-tolerant species (larch and ponderosa pine with lesser amounts of Douglas-fir).

In the higher elevations forests that occupy the subalpine biophysical setting on the IPNF, the fire regime could be characterized as having a 150-175 year return interval for stand replacing fires with mixed-severity fires every 30-50 years (Arno and Davis 1980, Barrett and Arno 1991, Smith and Fisher 1997).

Across the IPNF, the large, infrequent stand-replacing wildfire disturbances created a dynamic shifting mosaic of forest successional stages on a very large scale. In between the stand-replacing fires, vegetation, aquatic systems, and wildlife habitat had long periods to recover. Intermediate disturbances (low-and mixed-severity fire; some insect, pathogen, and weather events) introduced finer scale variability within these larger patches. As a result, blocks of wildlife habitat tended to be large, and blocks of mature/late-successional forest also tended to be large, but internally diverse. Terrestrial/aquatic interactions meant that watershed conditions and fish habitat also tended to form a dynamic, large-scale shifting mosaic. Over time any individual watershed could vary from predominantly mature/old forest (with wildlife and fish habitat) to almost all recently burned over. However, at any given time, at the larger scale of a river sub-basin (500,000 – 2,000,000 acres), the whole range of these conditions was represented in watershed-sized blocks of thousands, to tens of thousands of acres (USDA Forest Service 2000b, Hessburg et al. 2007).

Re-burns of fires have occurred throughout history in this region (Habeck 1987). Re-burns have been associated with, and have normally followed, severe fire years that have burned in high intensity conditions. Stand-replacing fires can create a high fuel loading in both standing and down wood. When the residual fuels from the first fire dry out after several years, the areas can become a strong candidate for re-burn when high temperatures, low humidity, and winds combine.

With the aid of the cool phase of the Pacific decadal oscillation and resultant cool and moist regional climate from 1940 to 1980, the Forest Service was very successful in suppressing wildfires. For the period from 1970 to 2010, over 97 percent of all the fires were less than 10 acres in size, mostly due to fire suppression. Suppression efforts have been particularly effective for low-and mixed-severity fires, virtually removing this agent as a significant disturbance process for the last 60 years. Rapid suppression of all fire starts has also removed most opportunity for fires to grow in size and intensity to become stand-replacing fires.

The success of fire suppression efforts (aided by the cool phase of the Pacific decadal oscillation) and resource management activities over the last 100 years has had a large influence on the structure and composition of forest and rangeland fuel conditions. The function and process of ecological systems has changed and fire suppression and some management activities have altered fuel loadings. As documented in Keane et al. (2002), the changes include an increase in shade-tolerant species, decrease in fire-tolerant species, increased vertical stand structure, increased canopy closure, increased vertical fuel ladders, greater biomass, greater fire intensities and severities, and increased insect and disease epidemics.

The influence of climate change on the occurrence and types of wildfires in the future is documented in the KIPZ Climate Change Report (USDA Forest Service 2010b). The report concludes climate changes are likely to increase the frequency of large fire years in the Northern Rockies and that fire seasons will be longer. Some of the climate change modeling efforts has suggested that by the 2080s, the amount of area burned by wildfires in the Pacific Northwest region (including Idaho and western Montana) would double or triple. However, as explained in the KIPZ Climate Change Report in more detail, there are a number of key sources of uncertainty regarding this issue.

Timber Harvest and Prescribed Burning

Because of the success of fire suppression efforts over the last several decades, regeneration timber harvests are the current predominant stand-replacing disturbance process. Regeneration harvest systems (clearcut, seed-tree, shelterwood) followed by prescribed fire can emulate some of the functions of stand-replacing fire, but not all of them. These silvicultural systems are generally successful in regenerating mixed species stands dominated by early successional shade-intolerant species. However, some regeneration harvests conducted prior to the mid-1990s tended to create unnaturally uniform conditions and did not leave the scattered residual snags, residual live tree patches, and scattered fire-tolerant large live trees (larch and ponderosa pine) that were characteristic of historic fires. In addition, the size of these regeneration harvest units (2 to 40 acres) was much smaller than patches created by historic, natural-fire regimes.

Over the last 15 years, silvicultural prescriptions in the Northern Region have largely been designed to emulate forest composition and structures created by historic fire regimes (Bollenbacher 2010). Intermediate harvest prescriptions such as thinning can favor species that are resistant to fire and create stand structures that are less likely to burn with high intensities. Even- or two-age and multi-age regeneration harvests can change species composition of forests by removing all or part of the current stand, replacing it with different species. The initial open-stand conditions created by even-and two-age harvest prescriptions generally favors resilient shade-intolerant species such as western larch, ponderosa pine, western white pine, and aspen. However, the number of acres that are being treated annually with some form of harvest has decreased dramatically during the last two decades. For example, approximately 17,000 acres were being treated by regeneration prescriptions each year in the late 1980s and this has dropped in recent years down to approximately 1,100 acres on the IPNF (USDA Forest Service 1989b and USDA Forest Service 2010a). Relative to the entire forested acreage on the IPNF, the recent level of 1,100 acres per year represents less than five-hundredths of 1 percent.

The effects of timber harvest on successional processes often depend on whether or not harvest is accompanied by prescribed fire. Where prescribed fire is used, impacts on understory vegetation may more closely replicate the effects of natural fire, and favor fire-adapted, shade-intolerant tree species. Where there is timber harvest with neither prescribed fire nor any other type of site preparation advanced regeneration of shade-tolerant, drought-and fire-intolerant species are more likely to dominate the post-harvest stand (Zack 1994).

Prescribed fire has the potential to emulate many natural-fire ecosystem functions. However, the scale, seasonality, severity, and internal variability of natural fires need to be considered in developing fire prescriptions. To date, prescribed fire efforts of this sort have been relatively small scale compared to natural disturbances.

Insects and Pathogens

Many insects and diseases are found on the IPNF and most are native and exist at endemic levels. However, there are some native as well as non-native insects and diseases that are likely functioning outside of their historic role. Other forest diseases, such as stem decays, rusts, needle diseases, and dwarf mistletoe, exist on the IPNF but are generally not considered to be significant as they are likely functioning within their historic role.

Mountain pine beetles in white pine, ponderosa pine, and lodgepole pine (and occasionally spruce beetles) are capable of serving as stand-replacing agents. These beetles have a mixed effect on succession. They can open canopies enough to provide regeneration opportunities for shade-intolerant tree species, but more commonly they release shade-tolerant understory tree species. By the fuels they create, bark beetles can influence the probability of large stand-replacing fires, which in turn can reset the successional sequence. In some situations, Douglas-fir bark beetle can also do the same thing on a smaller scale.

As part of the assessment on climate change, a hazard analysis was conducted to determine how much of the forests were susceptible to mortality from mountain pine beetle, Douglas-fir beetle, and western pine beetle (USDA Forest Service 2010b). This report summarizes the current hazard rating as well as the estimated losses that may occur to stands for the period from 2005 to 2020 (table 7). It is estimated that during that period, up to 29.9 percent of the lodgepole pine may be killed by mountain pine beetle; up to 21.6 percent of the Douglas-fir may be killed by the Douglas-fir beetle; and up to 0.6 percent of the ponderosa pine could be killed by either mountain pine beetle or western pine beetle.

Historically, root pathogens most commonly acted as thinning agents. In natural, mixed-species stands, root pathogens caused the greatest mortality in Douglas-fir, followed by true firs (i.e., grand fir and subalpine fir). White pine and larch were the most resistant tree species (Hoff and McDonald 1994, Monnig and Byler 1992). Root pathogens thinned out the Douglas-fir and favored the pines and larch, which increased the amount of pine and larch over the first 150 plus years of stand life (Rockwell 1917). A recent analysis was conducted on the Forest to determine the root disease hazard on lands within the boundaries of the IPNF. The results indicate that approximately 18.2 percent of the area has a high hazard, 37.3 percent is moderate, 44.3 percent is rated as low and approximately 0.1 percent has no hazard (additional information about this analysis is available in the project record).

Table 7. Estimated Bark Beetle Hazard and Estimated Loss 2005-2020[1]

Bark Beetle and Tree Species	Hazard Class				Estimated Loss			
	High	Moderate	Low	None	High	Moderate	Low	Total
Mountain Pine Beetle in Lodgepole Pine	4.6%	12.9%	3.3%	79.2%	2.7%	6.5%	19.8%	29.9%
Mountain Pine Beetle/Western Pine Beetle in Ponderosa Pine	0.1%	2.9%	1.5%	95.5%	0.1%	0.5%	0.1%	0.6%
Douglas-fir Beetle In Douglas-fir	5.4%	25.2%	20.0%	49.4%	3.2%	11.3%	7.0%	21.6%

[1] This information was derived by using FIA data and the mountain pine beetle hazard rating model imbedded in the Forest Vegetation Simulator model

Historically, western white pine was a common tree species on the IPNF, and dominated a very large part of the moist habitat types. In the early part of the 20th century, white pine blister rust (a Eurasian disease) was accidentally introduced to western North America. This exotic disease, combined with a mountain pine beetle outbreak in white pine in northern Idaho in the late 1930s, was the primary cause for the loss of white pine in this area (Neuenschwander et al. 1999). With the loss of white pine, there have been large increases in the amount of Douglas-fir and subalpine fir cover types, and a major acceleration of forest succession toward shade-tolerant, late-successional true firs (grand fir), hemlocks, and cedars.

Historically, western white pine had an important ecological role in forests of the Interior Northwest (Harvey et al. 1995, Monnig and Byler 1992). Especially important was this species ability to form a stable, relatively long-lived, forest that was perpetuated by a combination of mixed-severity and stand-replacing wildfires (Zack and Morgan 1994). Even though fire occurred in this forest type fairly regularly, old-growth structures often persisted for several centuries. Across its range, western white pine is now estimated to be less than 5 percent of what it was at the turn of the 20th century (Neuenschwander et al. 1999).

In an attempt to restore this species to the landscape, there have been successes in genetically improving tree resistance, planting those trees, and then using cultural treatments like pruning to improve survival (Schwandt et al. 1994). The best strategy to save white pine from blister rust is to increase the numbers of rust resistant white pine in these ecosystems by aggressively planting them in openings (Fins et al. 2001, p. 10; and Samman et al. 2003, p. ii).

With the impact of white pine blister rust and the decrease in fire, the role of insects and pathogens as disturbance agents is growing and changing. White pine blister rust accounts for major changes in forest successional patterns, having removed more than 90 percent of two conifer species (white pine and whitebark pine). With the absence of white pine and decreased amounts of ponderosa pine and larch, root pathogens have been transformed from thinning agents into major stand-change agents in Douglas-fir and true fir stands. Root pathogens now produce significant canopy openings on many sites. Depending upon the habitat type, root pathogens may either stall stands in a diseased shrub/sapling/open pole successional stage, or strongly accelerate succession towards shade-tolerant species.

Bark beetles have also changed their role. Because there is more Douglas-fir relative to historical conditions, Douglas-fir bark beetles are now more important change agents than they were historically. In all but the driest habitat types, Douglas-fir bark beetles accelerate succession in the short-run, and in the long-run they create fuel conditions and stand structures that may increase the risk of stand-replacing wildfires.

Native insects and pathogens are also now responsible for a relatively much larger proportion of forest disturbance than they were historically. The impact of insects and pathogens in the short-term is to strongly accelerate succession towards late seral, shade-tolerant tree species. An analysis of pathogen and insect impacts in northern Idaho and western Montana by Hagle et al. (2000) examined successional changes for the period 1935 to 1975. This analysis shows that in 40 years, pathogens and insects changed forest cover types to more late-successional, shade-tolerant tree species on over 80 percent of the area dominated by moist forest habitat types (Byler and Hagle 2000). The same analysis of insect and pathogen impacts also showed that almost 40 percent of the moist habitat type area analyzed was either stalled in small tree structures or was actually moving back towards the small tree structures as a result of the removal of the largest trees.

The potential influence of climate change on some of the key forest insects and diseases of the Northern Rockies is discussed in the KIPZ Climate Change Report (USDA Forest Service 2010b). In addition, a literature review of climate change and forest diseases of Western North America is presented in Kliejunas et al. (2009). These documents conclude that climate change will lead to reductions in tree health and will improve conditions for some insects such as bark beetles and highly damaging pathogens such as root diseases.

Forest Vegetation Condition

Forest composition, structure, and function are used in describing forest vegetation condition. Composition is described by the tree species and their amounts on the Forest. Structure is described by size-class, snags, and density of stands. Function is described by landscape patterns. As described in the preceding sections, disturbance affects all these attributes, resulting in current forest vegetation conditions and shaping conditions into the future. The combination of these vegetation conditions reflects its resistance and resiliency to disturbance and stressors, resulting in potential future conditions and the ability to adjust to climate change.

Approximately 96 percent of the national forest land on the IPNF is classified as forested (Vegetation Mapping Project). Within these forested plant communities, trees are the largest and most dominant plants; therefore, they have a large influence over the composition, structure, patterns, and processes that occur on the Forest. In addition, because trees dominate most landscapes on the IPNFs, they are very important to aquatic ecosystems and habitat for wildlife species. Lastly, not only do the trees provide timber and other products for human use, they also provide a host of amenity and intrinsic values (e.g., scenery, recreation, spiritual, cultural). For all of these reasons, the discussion in the following sections focuses on describing the condition of the trees across the IPNF, as opposed to the many other types of plants (e.g., shrubs, forbs, ferns, grasses, mosses and lichens).

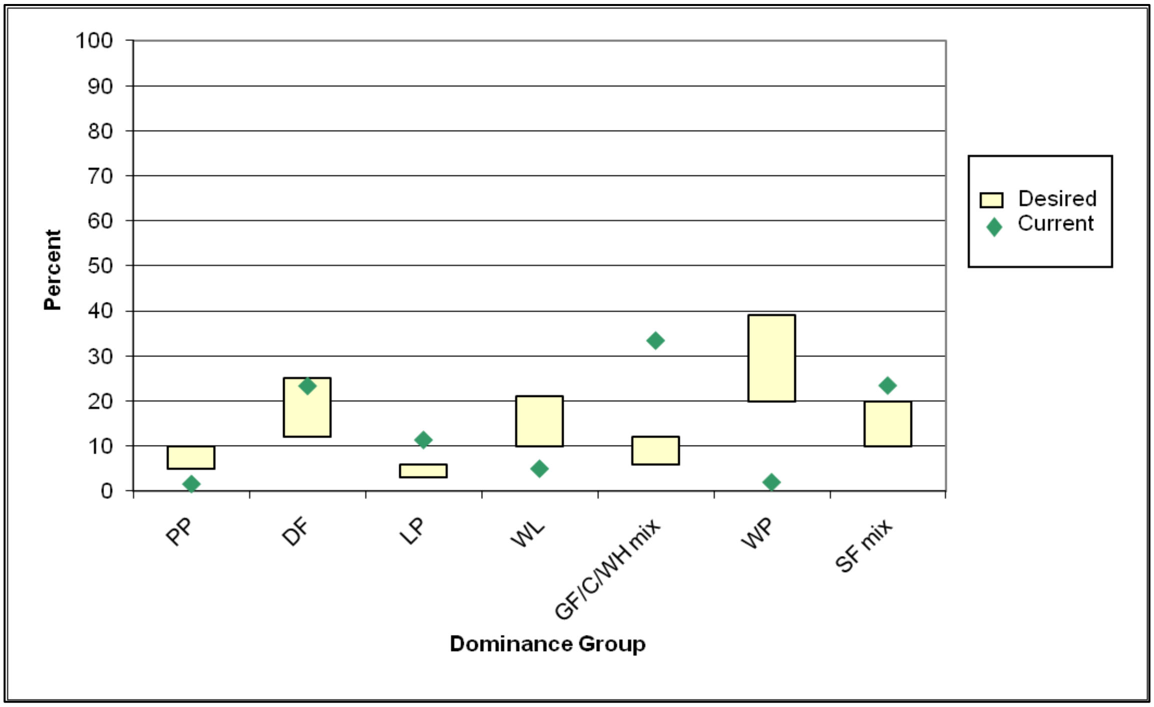
Forest Composition

On the IPNF, there are fourteen native conifer species[1] as well as five broadleaved species[2]. The conifer species typically dominate the forests with the broadleaved species being much less prevalent. Forest stands are usually composed of different combinations of tree species with various abundance levels. Often, a mixture of three to five conifer species will occur within an individual forest stand. However, it is not uncommon to find stands that contain six to eight different conifer species as well as one or two broadleaved species. “Pure” stands that contain only one tree species are relatively rare, and it is even somewhat uncommon to find a stand that contains only two tree species.

A classification system was developed based on the most dominant tree species, or mix of common species, that occurs in the forest stands. The result is that there are eight different Dominance Groups to describe the composition of the forest communities. Figure 7 illustrates how much of the Forest is currently occupied by the various Dominance Groups as well as the desired range. The “grand fir/cedar/western hemlock” mix represents those areas that are dominated by one or more of those three tree species. The “subalpine fir” mix Dominance Group includes areas dominated by one or more of the following species: subalpine fir, Englemann

[1] Grand fir, subalpine fir, subalpine larch, western larch, Engelmann spruce, whitebark pine, lodgepole pine, western white pine, ponderosa pine, Douglas-fir, pacific yew, western redcedar, western hemlock and mountain hemlock.
[2] Red alder, water birch, paper birch, quaking aspen, and black cottonwood.

spruce, whitebark pine, mountain hemlock, or subalpine larch. The remaining Dominance Groups shown in figure 7 are named for the single most abundant tree species in the stand.



PP = ponderosa pine; DF = Douglas-fir; LP = lodgepole pine; WL = western larch; GF/C/WH mix = grand fir/cedar/ western hemlock mix; WP = white pine; and SF mix = subalpine fir mix

Figure 7. Desired and Current Forest Composition by Dominance Group at the Forestwide Scale

For the IPNF, the most abundant Dominance Groups are the grand fir/cedar/western hemlock, Douglas-fir, and subalpine fir (figure 7). Each of those groups occupies at least 23 percent of the forested area. Much less common are the ponderosa pine, western larch, and western white pine Dominance Groups. Those relatively rare groups each occupy less than 5 percent of the forested area. The lodgepole pine Dominance Group is intermediate in abundance, occupying approximately 11 percent.

In addition to depicting the current condition, figure 7 illustrates the desired amount for each of the Dominance Groups. The desired ranges that are illustrated in the figure represent an approximation of the historic range of conditions for forest composition. The goal is for management actions to move species composition towards the desired ranges.

In a comparison of the current and desired conditions, it is apparent that the objective is to increase the amount of western white pine, ponderosa pine, and western larch across the Forest; and to decrease the amount of grand fir/hemlock/cedar mix, Douglas-fir, lodgepole pine, and subalpine fir mix. The species to increase are drought-and fire-tolerant, and are relatively resistant to insects and diseases. The species to decrease are relatively drought-and fire-intolerant, and are fairly susceptibility to various insects and disease. Changing the forest composition towards the desired ranges will increase resistance and resiliency, reducing effects from drought, fire, insects, disease, and climate change (McKenzie et al. 2009).

There are two primary reasons for selecting the specific desired ranges for the Dominance Groups that are depicted in figure 7. First, it is generally recognized in the scientific literature that the most effective approach to maintaining biodiversity, and therefore the sustaining forest ecosystems, is to manage them so that the conditions and processes approximate the range of conditions that occurred historically and with which all of the native species and communities evolved under (see earlier discussion on HRV for more detail). Second, when considering how climate change may affect forest vegetation, the same general goals regarding what the desired forest composition should be are appropriate. That is, relative to the current conditions, the desire is that the forests contain a greater abundance of tree species that demonstrate more of the following traits: less susceptibility to being killed by forest insects and diseases, more resistance to fire, more tolerance of drought, relatively long-lived, and being more productive.

The potential effects of future climate change scenarios on forest composition on the IPNF are explored in the KIPZ Climate Change Report (USDA Forest Service 2010b). Thus far, most modeling efforts do not produce consistent predictions on how climate change might influence forest composition. In addition, a number of important factors that could affect predictions have yet to be included in model simulations. However, the general consensus seems to be that projected changes in climate are likely to significantly stress many forest communities and tree species. Therefore, it would be logical to attempt to increase the abundance of tree species in the forest that tend to exhibit more resistance and/or resiliency towards the common agents and/or conditions that can lead to stress and mortality. For example, some forest entomologists suggest that climate change is likely to increase bark beetle population eruptions and tree mortality (USDA Forest Service 2010b), and therefore, by increasing the abundance of tree species that tend to be resistant to beetle attacks, such as western larch, it could lead to a more resilient forest. In addition, western larch and ponderosa pine are very resistant to fire-caused mortality and are long-lived. Given that climate change may increase the incidence of large stand-replacing wildfires (USDA Forest Service 2010b), it is desirable to increase the abundance of these two species in order to create more resilient forests. Western white pine, which is not only very unrepresented in the forests of north Idaho relative to historical conditions, but this white pine tree is very productive and is fairly resistant to root diseases. In addition, if the abundance of this pine could be increased, it could potentially serve to sequester more carbon than some other tree species. If a combination of white pine, ponderosa pine, and larch are restored in locations where root disease severity and species composition is high for susceptible species such as grand fir, Douglas-fir, and hemlock, then significant potential carbon sequestration benefits will result at both the stand and forestwide scales. By trending the forest composition towards more resistant and resilient conditions, stress complexes, such as those that develop from drought, fire, insects, diseases, and climate change, could be reduced (McKenzie et al. 2009, USDA Forest Service 2010b). This approach of reducing the stresses on the forest represents one of the adaptive management approaches to climate change that has been identified, and it has been called a “no regrets” strategy (Joyce et al. 2008). However, to be effective, this strategy must be applied at the scale of the problem. Small steps over long periods of time may not meet the expectation of having a resilient forest ecosystem anytime soon.

Western White Pine

With the loss of western white pine, the forests on the IPNF are much less productive and are unstable. They have become insect-pathogen-fire-prone forests that are less valuable for many amenities, including carbon sequestration (Atkins et al. 1999, Harvey et al. 1995, Monnig and Byler 1992). Despite their inherent high growth potential, the forests that were formally dominated by western white pine trees are now one of the lowest storage compartments for fixed carbon in the northern Rocky Mountains (Birdsey 1992). In the past, northern Idaho white pine sites have produced high volumes of white pine and other species and volumes that rank among the best in the country (Haig et. al. 1941).

Historically, western white pine was considered to have served as a “keystone” species in forests within this area. As discussed in detail in Mills and Soule (1993), a keystone species is one whose loss leads to significant changes in ecosystem structure, materials, and energy flows. Because of the blister rust disease, the mountain pine beetle outbreak in white pine in the late 1930s, and subsequent logging to capture expected morality from the disease, very little white pine remains and this trees’ ecological role as a keystone species has been altered (McDonald et. al. 2000). As depicted in figure 7, western white pine historically dominated approximately 20 to 40 percent of the forested area on the IPNF, while it is only dominate on a few percent of the acres today. Therefore, there are a lot of processes and functions that have been altered. For example, because stands dominated by western white pine have different canopy structures than stands without white pine, the dynamics of hydrologic processes could have changed (McDonald et. al. 2000). Due to the loss of the western white pine, these forests now both accumulate less carbon as a result of tree growth, but they also release more carbon as a result of accelerated decomposition of the more rot prone species that replaced the white pine (McDonald et. al. 2000). In addition, increased mortality from root disease, insects, and low levels of carbon sequestration in the main canopy of the Forest would increase fuel loads and these forests would have more ladder fuels that could facilitate a relatively slow moving surface fire to become a faster crown fire. The shallow rooted, climax species that have low and dense crowns have larger accumulations of litter on the soil surface than do forests dominated by seral species. This can lead to more nutrients (mostly nitrogen) in the top soil horizon and predispose them to potential losses from wildfires (Harvey and Morgan 2001).

As briefly mentioned above under the heading of “Insects and Pathogens,” the IPNF has been helping to restore the western white pine to the landscapes of northern Idaho. One of the efforts involves a tree improvement/ breeding program that is designed to build upon the natural resistance that some white pine trees have towards the non-native blister rust fungus. Then, seedlings that have been improved upon to have greater levels of resistance towards the disease are planted out in openings created by fires or harvest activities. During the review of the public comments on the DEIS, some respondents questioned the reason for the breeding program when the “natural” populations of white pine had some levels of resistance already. The following discussion represents a response to that public concern/question[1].

The advancement of blister rust resistance in naturally regenerated western white pine through natural selection is one facet of the western white pine restoration program in the Northern Region of the Forest Service (which includes the IPNF). The role of natural regeneration needs to be evaluated in the context of both natural selection and the current threats facing western white pine. The same threats that are facing other five-needle pines are also negatively impacting western white pine: blister rust has already been mentioned, but also keeping western white pine from occupying its former range in the Inland Northwest are mountain pine beetle epidemics and altered fire regimes (both fire exclusion and catastrophic wildfire). Though white pine has a generalist adaptive strategy (Rehfeldt et al. 1984), the impacts of predicted warmer and drier climates, or warmer and variable participation will also impact the persistence and distribution of western white pine (Richardson et al. 2009). Examination of historic range of variability and current species distribution indicates western white pine is occupying a position of 5-10 percent of its former range (Fins et al. 2001). If reliance on natural regeneration was a successful strategy in and of itself, then we would have seen an increase in the species distribution since the identification of phenotypically resistant western white pine in the early 1950s; however, current

[1] The information that follows was provided by the Regional Forest Geneticist for the Northern, Rocky Mountain, Southwestern and Intermountain Regions of the Forest Service (Mary F. Maholovich, PhD).

species distribution levels are remaining with the range of 5-10 percent range, showing no expansion.

There is a fairly widespread misunderstanding of expectations of blister rust resistant material available from the genetics program, typically centered on the definitions of immunity, resistance, and susceptibility. Immunity implies the complete absence of rust symptoms: no spotting, no branch flagging, and no active or inactive cankers. The genetic mechanism behind this response is usually single gene or maybe oligogenic inheritance (~ 5-7 genes) (Van Der Plank 1984). A related concept is virulent races of rust and major gene resistance. Interior western white pine does not exhibit major gene resistance, or a gene-for-gene action between white pine and blister rust, unlike coastal western white pine (Champion Mine race) or sugar pine (Happy Camp race) (Kinloch and Dupper 2002). Major gene resistance is considered evolutionary primitive to partial gene resistance (Nelson 1978). Crop and agronomy programs emphasizing stripe rust and smut resistance provide examples of how quickly varietal releases must be continually developed to overcome increased virulence in these gene-for-gene systems. It is both biologically and economically unfeasible to try and develop immunity in a selective breeding program. As such, since we are not developing immunity in our white pine genetics program, we are not applying undue selection pressure on the pathogen (Fins et al. 2001).

The Merry Creek location is elucidated to be a location where a putative virulent strain of blister rust occurs in Idaho. There are no peer-reviewed publications confirming a more virulent rust resistant strain in the Inland Northwest. Virulence typically results from of a formerly neutral allele increasing in frequency in the population and thereby inferring higher infection levels (Van Der Plank 1984) or through phenotypic plasticity (McDonald et al. 2005). Epidemiologically, virulence in a pathogen is typically not from mutation, as mutation rates are very rare and even rarer that these new genes would have a positive fitness value and favored via natural selection. For a western white pine tree to remain alive even though cankered is an important resistance mechanism (canker tolerance) for it permits blister rust to continue its life cycle, thus decreasing selection pressure for new races of rust (Bingham et al. 1971, Hoff 1982).

If a virulent strain of blister occurred among all of the stock types at the Merry Creek location we would also see high levels of mortality in all of the stock types (control, F1, B1, and F2); mortality and infections vary by stock type. One thing to note in both the 1971 Merry Creek test cited below and the 2005 Merry Creek realized gain trial adjacent to this test, is the poor performance of the control lot relative to F1, B1, and F2 stock types. The controls serve as examples of unimproved and hence, expectation of naturally regenerated western white pine. Based on 7-year data from the 2005 Merry Creek test location, infection levels in the control plots is 24 percent and only 9 percent in the F2 stock (Mahalovich, unpublished data). What is more compelling are those data reported for the 1971 Merry Creek test based on 26-year data (Fins et al. 2001). Infection levels are 100 percent in the controls and 93 percent in the F2 stock; however, the control lot, representing what we can expect from natural regeneration has achieved 100 percent mortality. Rather than focus on this one test location, three other sites were reported in Fins et al. (2001). Averages over four test locations are shown in table 8.

Table 8. White Pine Blister Rust Infection and Mortality Levels for Each Stock Type (averages expressed as percentages)

Stock Type[1]	Infection (%)	Rust Mortality (%)
F2	60.3 (± 30.3[2])	25 (± 27.4)
Control	95 (± 4.7)	67 (± 29.1)

[1] F2 stock type represents the white pine seedlings that contain rust resistant mechanisms that resulted from the rust resistance breeding program. The Control stock types are white pine seedlings that have not been breed to be resistant to the blister rust

[2] These numbers in parentheses are the confidence intervals surrounding the mean estimates

Resistance as defined in an individual though infected and exhibiting blister rust symptom(s) is able to survive, thrive, and reproduce. The objective of the genetics program is balancing selection (Mahalovich 2010), recognizing that blister rust cannot be removed from the landscape. This approach is also documented in (Fins et al. 2001). It remains to be seen if the western white pine and white pine blister rust will evolve into a mutualistic or symbiotic host-pathogen relationship. The genetics program incorporates seven rust resistance traits at the family and within-family levels; six of those traits require infection for the resistance to be expressed. Reported infection levels, such as the 60.3% cited among four long-term tests need to be adjusted for the frequency of the rust resistance traits to determine susceptibility (60.3 – 27% using Cycle 22 data) = 33.3 percent. Our deployment strategy is not based on the premise of artificially increasing the numbers of some resistant genotypes. Family selection of partial gene resistance traits is based on a weighted index and within-family selection is based on an individual exhibiting no-spot, needle shed, short shoot, or bark reaction resistant traits. Since orchards are blocked by those four traits, an equal number of each of the individuals by each of these four traits (plus the background level of improvement via family selection) serves to provide a balanced selection approach in the host for the express purpose of not applying undue selection pressure in the pathogen (Van Der Plank 1983, Mahalovich 2010).

The expected gains of 66 percent rust resistance is based on nursery data (Fins et al. 2001). We now know that the realized gain is 20 percent (Lupo 2004) based on 30-year data from similar F2 stock types at Canyon Creek (IPNF) and Hog Meadows (Nez Perce-Clearwater NF). We do not see a loss in family representation (effective population size) nor do we see a differential representation among the four, individual-tree traits over time (Lupo 2004). Restoration progress will certainly proceed more rapidly with planted, rust resistant stock and known levels of genetic diversity (Kim et al. 2010), without concerns over founder effects or genetic drift curtailing genetic diversity in naturally regenerated western white pine.

Broadleaved Species

In addition to conifers, there is a small amount of area (approximately 0.3 percent) of the forest that is dominated by broadleaved species. These species typically occupy in relatively small stands, and are often located in riparian areas or on moist upland sites. Of the five species that occur on the IPNF, paper birch, quaking aspen, and black cottonwood are the most common with red alder and water birch being relatively rare. Although these species are not shown in figure 7, the desire is to see an increase in their abundance on the Forest.

Whitebark Pine

Whitebark pine is a tree species that was grouped together with some other species (subalpine fir, Englemann spruce, mountain hemlock, subalpine larch) to form the subalpine fir mix Dominance Group that is presented in figure 7. Whitebark pine trees occur on some of the higher ridges and mountain tops across the IPNF. Where they occupy lower elevations within their range, they typically serve as a minor early seral species in mixed conifer stands. At the other extreme, where they are found at the uppermost elevations in rather pure stands, they can serve as a major climax species. This tree is considered a “keystone” and “foundation” species because of its significant role in subalpine ecosystems (Keane and Parsons 2010, Tomback and Kendall 2001, Tomback et al. 2001).

The most recent inventory information indicates that some live whitebark pine trees occur over approximately 1.2 percent of the forested area of the IPNF (USDA Forest Service 2010 September). Recently, the U.S. Fish and Wildlife Service completed a status review of whitebark pine for potential listing as a threatened or endangered species. They concluded that the species warranted listing but was precluded because of the need to address higher priority species. Whitebark pine is now designated as a Candidate species. The regional forester has placed whitebark pine on the sensitive species list for Region One, which includes the IPNF. The principle reasons for the concern over this tree species stems from the fact that mountain pine beetles, fire exclusion policies, and the introduced non-native white pine blister rust disease have been found to be responsible for the significant decline of this species across its range in western North America (Keane and Parsons 2010, Keane et al. 2012, Schwandt 2006). In addition, climate change could detrimentally affect this tree species either directly or indirectly through interactions of bark beetles, blister rust, wildfires, or a combination (Keane and Parsons 2010, USDA Forest Service 2010 September, USDI Fish and Wildlife Service 2010a).

In northern Idaho and northwestern Montana, white pine blister rust has killed a quarter to half of all whitebark pine trees, and since the late 1990s, mountain pine beetle-caused mortality has increased (USDA Forest Service 2010 September).

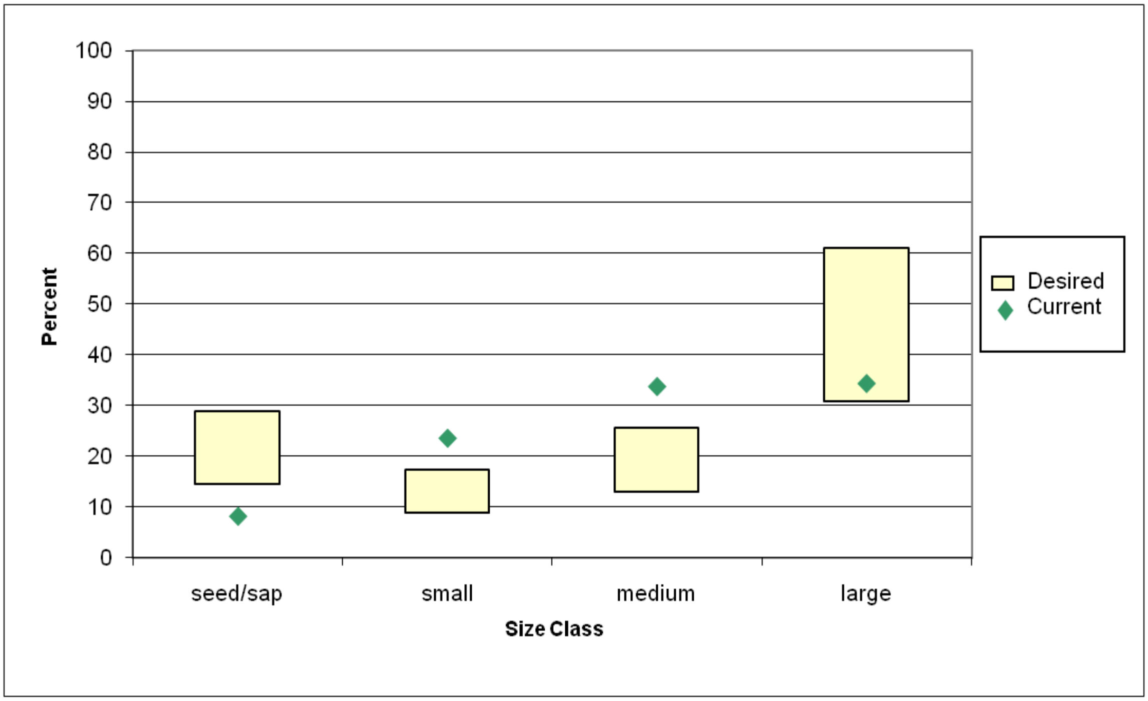
The desired condition for whitebark pine is to increase the abundance of this species on the IPNF and increase the resistance and resiliency of them to disturbances. Active restoration efforts, such as those that are described in Keane and Arno (2001) and Schwandt (2006) are believed to be necessary in order to achieve these objectives. Without management intervention, losses of this tree across its range could have major consequences for biodiversity (Tomback 2007).

In 2012, Keane et al. published a comprehensive restoration strategy for this tree across its entire range (Keane et al. 2012). The IPNF has been implementing many of the restoration actions that are suggested in that strategy for the last one to two decades. For example, the IPNF has been collecting seed, identifying rust resistant trees, testing rust resistance of progeny, conducting prescribed burns, planting seedlings, and monitoring sites (USDA Forest Service 2010, September, appendix G). However, to date, the number of acres that have had some form of restoration activity occur on them has been limited. As described in more detail in the environmental consequences section, most of the whitebark pine sites overlap with habitat for one or more wildlife species that are listed as threatened or endangered under the ESA. The Canada lynx, woodland caribou, and grizzly bear all have habitat that overlaps with that of the whitebark pine. The presence of habitat for those wildlife species makes it difficult to aggressively implement restoration activities that are needed for the whitebark pine. Other challenges have been the limited funds that have historically been available as well as the difficult access to many of the remote, high elevation sites.

Forest Structure

Size Class

Four size classes were developed to broadly describe and quantify stand structure across the Forest. Figure 8 illustrates how much forested land is currently occupied by each of the four size classes. Approximately 34 percent of the forested area on the IPNF is dominated by trees in the large size class, with a similar amount in the medium size class. The small size class is somewhat less common at approximately 24 percent, and the areas occupied by the smallest size trees, the seed/sap size class, occupy approximately 8 percent. In general, stands in the seed/sap size class range from 0 to 35 years old. Stands in the small and medium size classes range in age from 35 to 60 and 60 to 100 years old, respectively. Stands in the large size class are generally 100 years old or older.



(seed/sap = 0-5" DBH trees, small =5-10" DBH trees, medium =10-15" DBH trees, and large =>15" DBH trees.)

Figure 8. Desired and Current Forest Structure by Size Class at the Forestwide Scale

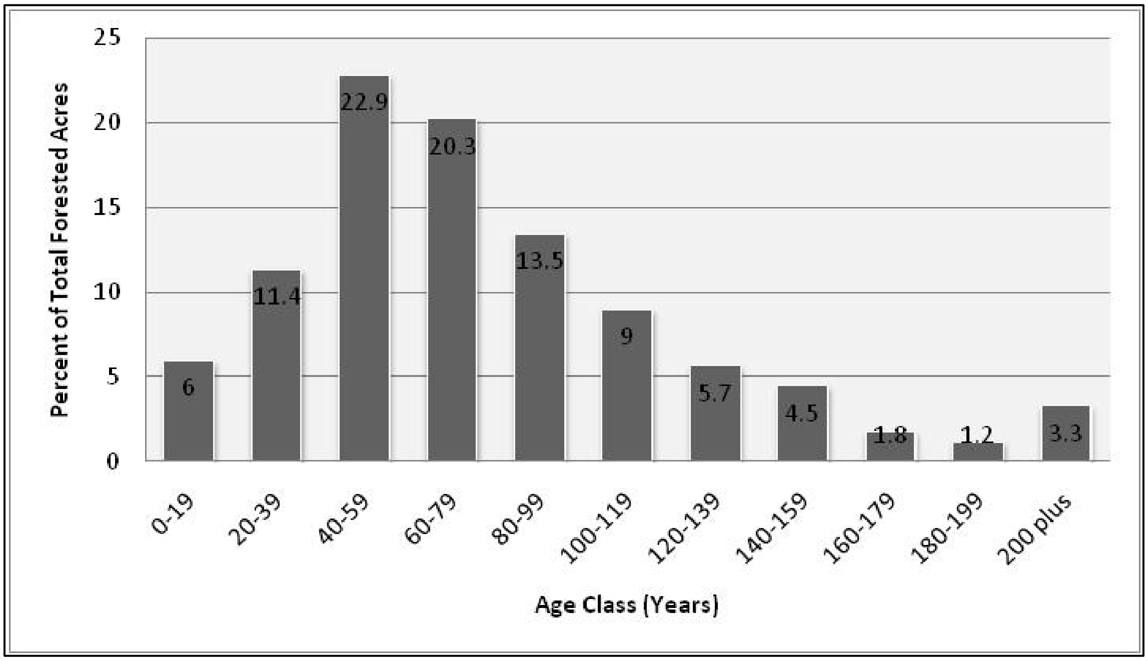
In addition to depicting the current distribution of size classes on the IPNF, figure 8 also illustrates the desired amount. The desired ranges that are illustrated in the figure represent an approximation of the historic range of size classes. In a comparison of the current and desired conditions, it is apparent that the goal is to increase the amount of both the seed/sap and large size classes, and reduce the amount of the small and medium size classes.

The importance of late-seral forest structures for the maintenance of biological diversity and wildlife habitat is well recognized in the scientific community (Spies and Duncan 2009). However, the ecological importance of the early-seral forest structure has not been emphasized until more recently. Swanson et al (2011) authored a paper titled "The forgotten stage of forest succession: early-successional ecosystems on forest sites" and stresses the importance of these young forest stands in sustaining ecosystem processes and biodiversity. As depicted in figure 8 above, currently the amount of forest in the early-seral forest structure (represented by the seed/sap size class) on the IPNF is substantially less than the HRV for that type of forest, and therefore the desire is to substantially increase the amount of that type of forest for the ecological reasons that are articulated in Swanson et al (2011).

Age Class

Figure 9 presents the distribution of the current age classes of forest stands for the IPNF. As visually depicted in that figure, the distribution is skewed towards middle-aged stands that are approximately 40-100 years old. Those stands are generally in the mid-seral stage of forest succession and they comprise a very large percentage of the total forested acreage on the IPNF (approximately 57 percent). The 1910 wildfire as well as other wildfires in the 1920s and 1930s was the principal cause of that mid-seral, middle-aged bulge in the age distribution curve.

Although it was a much less significant factor compared to wildfires, regeneration type timber harvesting that occurred from approximately the 1940s to the 1970s also contributed to that bulge.



NOTE: The age-class information present in this figure cannot be used in determining old growth amounts on the Forest. See the project record for details on the data and methodology used in this figure.

Figure 9. Age class Distribution of Forested Acres over the entire IPNF

The bulge in the age class distribution has a number of implications, one of which concerns wildfire hazard. In general, these middle-aged stands tend to be dense and the trees within them are undergoing intense competition for limited sunlight, water and nutrients and this often results in competition-induced tree mortality. The trees that die either do so directly from this competition or more often, they are weakened to the extent that forest insects and/or diseases kill them. Dead surface fuels build up in these stands and many of the stands have dense tree crowns that predispose them to higher chances of crown fires. Lastly, stands within these structural stages often have shade tolerant tree species growing in the understory of the taller trees, and these understory trees can serve as ladder fuels to allow surface fires to transition into crown fires. Another issue that often occurs within these middle-aged dense stands is that many of the trees will develop into tall and skinny trees that are very susceptible to storm damage. As trees undergo competition between themselves, a tree will allocate resources (photosynthate) to different needs in order of priorities. Height growth has a higher priority than diameter growth (Oliver and Larson, 1996). This means that high-density stands may eventually develop tall, spindly trees because height growth continues even after diameter growth slows or stops. These unstable trees are very susceptible to snow or wind breakage and often fall over or break off and increase the surface fuel loadings. Some of the middle-aged stands on the Forest have had treatments within them to thin them out and/or to reduce the hazardous fuels within them. However, the percentage that has been treated is very low. As articulated in the plan components FW-DC-VEG-02 and FW-DC-VEG-05, the desire is to decrease the percentage of the middle-aged stands on the Forest. Typically these middle-aged stands are dominated by trees in the small or medium size classes.

Old Growth

The IPNF has adopted the definitions of old growth types that were developed by the Regional Old Growth Task Force, and documented in Green et al. 1992[1]. That document is a comprehensive report that not only presents old growth type descriptions for thirty different types of old growth in Region One, but it also provides the background, ecological concepts and process that was used to develop them. For the IPNF, there are ten old growth types that are described in detail in that publication (see pages 13-22). The rationale for using those definitions is not only included in that document, but it is also presented in Bollenbacher and Hann (2008) along with a summary of the science and understanding of forest practices intended to create, maintain, and restore resilient old growth stands.

The adopted old growth definitions cited above are specific to forest type (the dominant tree species) and habitat type group, and are defined by a minimum number of trees of a minimum age and diameter, in stands with a minimum density. The most common old growth types on the IPNF require at least ten trees per acre that are 150 years in age and 21 inches in diameter, and have a minimum stand density of 80 square feet of basal area. A thorough discussion concerning how the IPNF has been using the Green et al. 1992 publication to identify old growth stands is described in USDA Forest Service (2013). Old growth management direction that was provided in the 1987 Forest Plan is presented in the environmental consequences section.

The IPNF utilizes two different inventory and analysis “tools” to monitor and manage the old growth resource. One method uses inventory information from the FIA program, and the other method is a stand level, GIS map layer, used for project-level delineation and old growth management. The analysis process that utilizes the FIA data is documented in Region One Vegetation Classification, Mapping, Inventory and Analysis Report (Bush et al. 2007 and Report # 06-07, dated April 11, 2006). Information on the validity of using FIA data for old growth (as well as snag estimates) is available in Czaplewski (2004). The most recent analysis that was conducted for the IPNF using FIA data to determine how much old growth exist on the Forest was conducted in 2013 (Bush and Reyes 2013a). Based on that analysis, approximately 12.1[2] percent (with a 90 percent confidence interval of 9.8 percent to 14.5 percent) of the forested acreage across the entire IPNF meets the definition of old growth. As shown in table 9, the old growth is well distributed across the five GAs and ranges from approximately 9.2 to 15.9 percent. Confidence intervals for the individual GAs is reported in Bush and Reyes (2013a).

Table 9. Estimate of Old Growth on the IPNF by Geographic Areas and Forestwide (from FIA data)

Geographic Areas	Estimate of Percent Old Growth
Coeur d'Alene	10.4%
St. Joe	12.0%
Sandpoint/Pend Oreille	9.8%
Bonners Ferry/Kootenai	15.2%
Priest Lake	14.2%
Total Forestwide	**12.1**

[1] When referencing the Green et al.(1992) publication in this section, we are referring to the most recent version that was corrected via an errata in December of 2011.
[2] These FIA based old growth estimates are slightly different in this FEIS than they were in the DEIS. This is due to a more updated analysis being conducted (Bush and Reyes 2013a)

The IPNF stand-level GIS map layers of old growth represent a spatial depiction of stands that either currently meet the definition of old growth, or are being managed with an objective of meeting the definition sometime in the future (USDA Forest Service 2013). Stand-level information from the Monitoring Report indicates that 10.8 percent of the forested lands are occupied by stands meeting the old growth definition (data base special use codes 2,9,10, and 12). An additional 1.8 percent of the forested acres are being managed with the objective that they meet the old growth criteria in the future (data base special use code 11).

Due to their unique nature, the IPNF identifies and inventories “Ancient Cedar Groves” as a subset of old growth. These western redcedar groves are defined as areas that contain trees over 5 feet in diameter and with ages over 500 years old. These groves far exceed the minimum old growth age and tree size criteria. There are dozens of these groves located on the Forest and they occupy approximately 4,878 acres (USDA Forest Service 2013). Table 10 below indicates approximately how many acres of these cedar groves occur in the various GAs on the Forest. These groves have been referred to as the “redwoods of the northern Rockies” and “cathedral groves” due to their aesthetic qualities and the sense of awe that people often experience when visiting them (Parker and Johnson 1993). Although it is difficult to determine their age because of rot, Parker and Johnson (1993) estimate that some of these trees may be older than 3,000 years. These groves tend to occupy very moist or wet sites, generally on river terraces, toe-slopes, and streamsides. An ample supply of moisture from the water table has likely protected them from wildfire. These groves on the IPNF and elsewhere in the northern Rockies have been found to contain rare plant species such as certain ferns or moonwarts species (Lichthardt 1998).

Table 10. Acres of Ancient Cedars Groves by GA and Forestwide

Geographic Area	Acres of Ancient Cedar
St. Joe	1,963
Coeur d’Alene	207
Pend Oreille	53
Lower Kootenai	516
Priest	2,139,
Forest Total	**4,878**

As described in more detail in USDA Forest Service 2013, the old growth on the IPNF is well distributed across the GAs as well as across the eight habitat type series. The exception being that there are relatively few acres of old growth found on the drier sites (i.e. the Douglas-fir and drier end of the grand fir habitat series). The low proportion of old growth in these drier habitat type series is a function of the combined effects of the huge 1910 fire and other large high severity early 20th century fires; subsequent suppression of most low and mixed severity fires that served to maintain resilient old growth; late 19th century and early 20th century timber cutting; root diseases; and bark beetles. Much of the old growth inventoried on these two habitat type series is currently dominated by Douglas-fir or grand fir (as opposed to ponderosa pine or western larch), which are at risk from bark beetles and root diseases. Where the moister, non-riparian grand fir habitat types are adjacent to dry sites, the fires, root diseases, and bark beetles that strike the dry sites have a high probability of carrying over into adjacent Douglas-fir /grand fir stands. During drought years the larger grand fir growing on upland grand fir habitat types are at risk from fir engraver bark beetle attacks. In order to increase the proportion of old growth on our dry habitat type series, active management will often be required to manage stand density and restore more resilient tree species (ponderosa pine and western larch). A more comprehensive discussion on this topic may be found in USDA Forest Service 2013.

For the entire state of Idaho across all land ownerships, it is estimated that somewhere between 12 percent and 32 percent (depending upon what method one uses) of the forested lands are occupied by stands having old growth like structures (Witt et al. 2012). For the entire state of Montana across all land ownerships, it is estimated that approximately 14 percent of the forested lands are occupied by stands that meet the old growth definitions in Green et al. 1992 (Menlove et al. 2012).

Regarding the historic range of variability of old growth on the IPNF, there is no way to accurately determine how much of the forest may have met the Green et al. (1992) definitions of old growth. In order to determine whether or not a forest stand meets those definitions, it requires detailed information on how many trees per acre exist in the stand over a certain diameter and age, the total stand density, the forest type and lastly, the habitat type group that the stand occupies. No historical information exists that can provide that level of detail. Therefore, a numeric desired condition or an HRV estimate for old growth is not included in this analysis.

Because old growth stands provide valuable ecological and social functions, the IPNF developed a number of plan components for all the action alternatives that are designed to increase the quantity of old growth in the future, increase the resistance and resilience of the old growth to disturbances and stressors, and to increase the size of the old growth patches that exist in the future. More details of the old growth related plan components that are incorporated into the action alternatives are provided in the environmental consequence section. That section summarizes what the 1987 Forest Plan direction was for old growth, and contrasts it with the direction that is part of the action alternatives.

As discussed in chapter 2 of this FEIS in the section titled “Alternatives Considered But Eliminated from Detailed Study,” public comments were received during the scoping effort suggesting that the IPNF should include plan components in the action alternatives that would require the establishment of large old growth reserves, linkages between those reserves, as well as other measures to protect the existing old growth and to foster the development of additional old growth. In response to scoping comments, the IPNF considered an alternative that included those elements but for the reasons that were summarized on pages 33 and 34 of the DEIS, that alternative was eliminated from detailed analysis. However, after the DEIS was released to the public for comment, we received additional comments on this topic. Some of the old growth related comments received on the DEIS and draft Forest Plan were addressed in appendix G of this EIS, while other comments required a substantial amount of discussion to address them sufficiently, and those items are presented below.

We received a number of comments suggesting that old growth reserves be created to protect existing old growth stands and to develop additional old growth. The comments suggested that we should designate large areas of the forest that contain old growth stands and/or mature/middle-aged stands, and then protect them from the disturbances that could otherwise impact them (e.g., wildfires, insects, diseases, and humans). Some comments went further to suggest that if these reserves were burned up or heavily impacted by other disturbances, that they should be left alone and continue to be managed as old growth reserves even if they no longer contained old growth (or very little of it). Thus, the reserves would essentially be large dedicated areas (possibly with their own specific MA designation) where we hoped old growth type stands would develop one day and persist, but that at any given time, they could be dominated by much younger stands. Lastly, some commenters advocated that we take the existing old growth on the

IPNF, which is approximately 11-12 percent of the entire forested acreage, add to that amount another 18-19 percent of the forested acreage, to achieve a combined 30 percent of the forested area in reserves to be managed for old growth purposes. The premise of the 30 percent seems to be either that it may have represented an approximation of the average amount of the forested area on the IPNF that historically was in a condition similar to old growth, or possibly it was suggested because it represented the same figure that was set aside in reserves as part of the Northwest Forest Plan in Oregon and Washington.

While the approach of managing old growth by “reserving” large areas may be appropriate in some regions or types of forests, for example in western Oregon and western Washington where wildfires and other disturbances tend to be relatively rare, the widespread use of this strategy on the IPNF does not make ecological sense given our disturbance prone forests as well as the likely impacts from climate change. The old growth reserves that were established as part of the Northwest Forest Plan were called Late-Successional Reserves in the plan, and they essentially comprised 30 percent of the 24 million acres of federal land of the Pacific Northwest region. However, since their establishment in 1994 those reserves have failed to protect old forests in disturbance prone portions of that region and thus the ecological suitability of using reserves as a mechanisms to provide habitat for species that use old growth forests is being strongly questioned (Feinstein 2010, Spies et al. 2009, Noon 2009, Healey et al. 2008, Spies et al. 2006, Camp et al. 1996, Spies 2006, Camp et al. 1997, Camp 2001, Everett et al. 1994, Camp et al. 2006, Bauhus et al. 2009, Carey 2003). In addition, given the likelihood of a greater frequency of wildfires and other disturbances occurring in the future on the IPNF as a result of climate change impacts, relying on old growth reserves as the principal strategy for ensuring that amply old growth stands occur into the future makes no sense. Rather, the scientists that are cited above as well as other forest researchers generally advocate that a much broader, all-lands approach be used to increase the resistance and resiliency of the forests to disturbances, and thereby, increasing the chances that substantial amounts of old growth will persist into the future.

In Thomas et al. (2006) the authors review the implementation of the Northwest Forest Plan (NWFP) and provide suggestions for better achieving the goals of that plan. Several of the key points that the authors make are very relevant to the management of old growth on the IPNF. In order to continue to conserve old-growth trees and forests, the authors suggest that classic old-growth within the wetter habitat types be reserved, and that appropriate fuel treatments be undertaken in the drier habitat types to prevent the old trees from being killed from wildfires or bark beetles. Both of these suggestions have been incorporated into the action alternatives associated with this revised Forest Plan. For example, all of the existing old growth stands are being reserved (see FW-DC-VEG-03, FW-STD-VEG-01, FW-STD-VEG-02) while the stands (such as the ones on the drier sites) that have species or conditions associated with them that put them at risk for fires or other disturbances (such as bark beetles) that could kill the old growth trees, would be considered for treatments (see FW-GDL-VEG-01) as opportunities arise. In regard to the sustainability of old-growth in light of wildfire and other disturbance risks, the authors caution that “Unless the federal agencies consider the peril of inaction equal to the peril of action, the goals of the NWFP will not be reached”. As suggested by that quotation, simply circling an old-growth stand on a map and prohibiting all management activity from occurring within it, is not without risks.

In regard to perpetuating old growth forests in dynamic landscapes, Salwasser (2009) states “Perpetuating some older forests will require a combination of conditions within stands that enhance resilience against low to moderate disturbances and redundancy of developmental states across landscapes so that when major stand-replacing disturbances do occur, there are forests moving into older stages somewhere else to replace the altered stands. Where fires have been suppressed for long periods of time, selective removal of some biomass followed by use of managed fire-perhaps harkening back to pre-historical land use practices- may be needed to restore stand resilience." On dry forest sites (i.e., drier than the forests of western Washington and Oregon), Franklin (2009) says: "On dry forest sites, climate change encourages us to protect old-growth trees by restoring stands and landscapes to more sustainable conditions. Activities that improve survival of the key structural elements should be of highest priority, given recent wildfire history; furthermore, silvicultural targets should reflect the probability that fire seasons will be ever longer and more severe." The Forest Plan components noted in the previous paragraph as well as a number of other components (e.g., FW-DC-VEG 01, 04-06, FW-DC-FIRE-03, FW-OBJ-FIRE-01,02) have been included in the action alternatives to address the need expressed above by Salwasser (2009) and Franklin (2009).

The IPNF has over a half million acres[1] of mature forest stands that are essentially serving as a potential source of recruitment old growth (USDA Forest Service 2013). These mature forest stands do not meet the old growth definition now but they are dominated by 100 plus year old trees and barring huge wildfires or other stand replacing type disturbances in the future, a substantial amount of those mature stands have the potential to grow into old growth stands in the next few decades. As discussed later in this section, some of these stands may benefit in their development towards old growth conditions and their resiliency towards stand replacing disturbances by conducting mechanical treatments in them and/or the use of prescribed fire or natural unplanned ignitions.

In an effort to investigate how many acres of forested stands on the IPNF may meet old growth criteria in the coming five decades, two different approaches were used. The first was to use the FIA plot information for the Forest and simply "age" the trees on the plots to determine how much of the Forest may meet the old growth criteria in the future. As discussed in more detail in Bush and Reyes (2013b), the tree ages on the plots were increased by 10 years in five increments over a 50-year period. Then, for each decade (e.g., year 2023, year 2033, etc.) the amount of the forested vegetation that would meet old growth criteria was calculated. In this specific analysis, the trees on the plots were not "grown" in size nor were potential tree mortality modeled. Therefore, the only areas that were predicted to be recruited into old growth stands during the 50 year period were areas (represented by plots) that currently had enough large trees and stocking to meet the minimum criteria), but were only lacking in meeting the tree age criteria. Table 11 provides a summary of the results of that analysis. More information on the methodology and results of this analysis, including the confidence intervals, is provided in Bush and Reyes (2013b).

Table 11. Percentage of the Total Forested Area on the IPNF that Currently meets Old Growth Definitions and the Estimated Old Growth Amounts for each of the next 5 Decades, for the Forest as a Whole as well as for each of the Five Geographic Areas (GA)

Area	Year					
	2013	2023	2033	2043	2053	2063
Forestwide	12.1	14.4	15.5	18.4	21.2	23.1
St. Joe GA	12.0	14.7	16.5	19.7	23.3	25.4
Coeur d' Alene GA	10.4	11.1	11.9	13.9	16.9	19.7

[1] Those acres do not include mature stands dominated by lodgepole pine which are very prone to being attacked by mountain pine beetles.

Area	Year					
	2013	2023	2033	2043	2053	2063
Pend Oreille GA	9.8	10.4	11.5	12.6	15.6	17.2
Lower Kootenai GA	15.2	21.4	22.3	26.8	28.8	29.6
Priest GA	14.2	16.0	16.5	20.8	21.7	22.6

As illustrated in table 11 above, the amount of old growth that is predicted to occur across the Forest in the future increases substantially during the next 50 years. This specific analysis shows that the amount of old growth would almost double from current levels within the next 50-year period at both the forestwide scale as well as for each of the five GAs. As discussed in more detail in Bush and Reyes (2013b), this specific analysis does not factor in tree growth nor does it consider natural or man-caused mortality during that 50-year period. But it does provide evidence that in the absence of large scale dramatic disturbances over the Forest, that old growth amounts should increase in the future due to the large number of acres of forest stands on the IPNF that currently meet every old growth criteria except age, but that will meet the age criteria relatively soon.

The second approach that was used to investigate how much old growth may occur on the IPNF in the future utilized the SIMPPLLE and Spectrum modeling efforts that were undertaken to predict how forest succession, disturbances and management activities would influence forest vegetation conditions over time for the various Alternatives and under the different scenarios (i.e., with or without budget constraints and under different future climate assumptions). The primary advantage of this approach over the use of the FIA plots is that this modeling effort is able to capture how wildfire, forest insects and diseases, climate change and even management activities may impact forest conditions in the future. In addition, the SIMPPLLE model is able to simulate how the various disturbances, forest succession and management elements interact with one another in a spatial context. The methodology used for the modeling efforts is presented and discussed at length in appendix B of this FEIS as well as in Chew (2012), Henderson (2013) and Ecosystem Research Group (2012). The results of the modeling effort for each of the Alternatives that are analyzed in this FEIS are summarized in the environmental consequence section. However, one of the results is presented here. If no active management (with the exception of fire suppression) were to occur on the Forest for the next 50 years, and the future climate scenario of a warmer/drier climate is assumed, then the acreage of stands that would have structures similar to old growth is predicted to increase by approximately 112 percent over current amounts. The very large size class (stands that are dominated by 20”+ diameters) was used from the Spectrum model results for this estimate. The dramatic increase in old growth like stands over the 50-year simulation period occurred despite a substantial amount of predicted wildfire, root disease; bark beetle and defoliator caused disturbances (Ecosystem Research Group 2012).

In addition to the public comments that were submitted on the draft Forest Plan and DEIS regarding the creation of large old growth reserves, the IPNF also received a number of comments suggesting that additional or revised forest plan components were needed that would prohibit any vegetation treatment activity from occurring in existing old growth stands, or that would only allow treatments to occur in the drier types of old growth stands. The following discussion is meant to provide rationale for why those suggested changes were not made.

The IPNF deliberately established language within two components of the action alternatives (FW-DC-VEG-03, FW-GDL-VEG-01) that would allow vegetation management activities to occur within old growth stands if the activities were designed to increase the resistance and resiliency of the stands to disturbances or stressors, and if the activities would maintain the criteria for age and number of trees and basal area for the specific old growth type as described in Green et al. 1992 (errata corrected 12/11). Both the terms resilience as well as resistance (see glossary for definitions) are used in this EIS and revised Plan in the context of forest ecosystems and the desire to increase the resistance and resiliency of the forest vegetation to disturbances and stressors, such as wildfires, droughts, insects and diseases, and potential climate change effects. In regard to the specific desired condition that old growth stands are more resistant and resilient to disturbances and stressors (FW-DC-VEG-03), there are numerous ways that this could be achieved depending upon specific circumstances. The following examples are meant to provide the reader with an idea of the wide range of actions that might be proposed at the site-specific, project level. The examples are not a comprehensive list nor are they meant to preclude other actions from being proposed that are not described here. Mention of North Idaho Zone Old Growth Types in the examples below is referring to the old growth type descriptions in Green et al. 1992. Because one of the main functions of the old growth resource on the IPNF is to provide habitat for wildlife (and other organisms such as rare plants) that use old growth type stand structures, any treatments that are proposed would need to be supported by an appropriate wildlife analysis.

Example 1: Within old growth stands that occur in the Warm/Dry biophysical setting (i.e., North Idaho Zone Old Growth Type 1 and 4A) and that contain a substantial component of ponderosa pine or western larch, prescribed fire alone or in combination with the cutting of smaller trees could be used to emulate a non-lethal or mixed-severity wildfire that was relatively common on these sites historically, and that often maintained fairly open stands dominated by shade intolerant and fire resistant ponderosa pine and/or western larch tree species.

Example 2: Within old growth stands that occur in the Warm/Moist biophysical setting and contain substantial amounts of shade intolerant species (i.e., North Idaho Zone Old Growth Type 4B with western larch and/or ponderosa pine), prescribed fire alone or in combination with the cutting of smaller trees could be used to emulate a non-lethal or mixed-severity wildfire that occasionally occurred on these sites historically, and that served to extend the time that shade intolerant western larch or ponderosa pine could maintain their presence in stands that would otherwise become dominated by shade tolerant species (e.g., western hemlock, western redcedar, grand fir).

Example 3: Within old growth stands that occur in the Subalpine biophysical setting and contain substantial amounts of shade intolerant species (e.g., North Idaho Zone Old Growth Type 6 and 8 with whitebark pine and/or western larch), prescribed fire alone or in combination with the cutting of smaller trees could be used to emulate a non-lethal or mixed-severity wildfire that occasionally occurred on these sites historically, and that served to extend the time that shade intolerant whitebark pine or western larch could maintain their presence in stands that would otherwise become dominated by shade tolerant species (e.g., subalpine fir, Englemann spruce or mountain hemlock).

For examples 1-3 above, if cutting smaller trees is needed and the removal of the cut trees is necessary to meet the site-specific restoration objectives, then timber harvest may be proposed. The modified stand structure and fuel complex that results from the activities described in the examples above could increase the resistance of the large trees to potential mortality from disturbances and/or stressors (e.g., high intensity wildfire, bark beetle attacks, and/or potential climate change impacts such as more frequent or intense droughts).

Example 4: For the old growth types that are noted above in examples 1-3, another action that could be taken in some circumstances to increase the resistance and resiliency of the old growth stands is to use natural, unplanned fire ignitions for the same general purposes as noted above. However, because it is more difficult to predict and control the intensity, severity and size of fires that result from unplanned ignitions, the potential benefits of using this tool in a specific circumstance would be carefully weighed against the risks.

Example 5: Other examples of activities that could be used in old growth stands or adjacent to old growth stands to increase resistance and resiliency may include treatments for non-native invasive plants, small scale tree planting of blister rust resistant white pine seedlings in openings within old growth stands that are created from wildfires, using anti-aggregate pheromones to prevent or minimize the loss of susceptible trees to bark beetle attacks or raking away the unnatural accumulation of bark debris from underneath ponderosa pine trees prior to prescribe burning to minimize potential tree mortality.

In regard to the scientific basis for the potential need to conduct the type of vegetation treatments that are described above, the following discussion cites relevant literature. Treatments in the drier forest types would allow the ability to improve the resiliency, resulting in stands more able to withstand bark beetle mortality and stand-replacing fire (Agee and Skinner 2005, Fettig et al. 2008). Restoring forest composition and structure before wildfires occur should allow fire to play its characteristic role in maintaining ecosystem structure and function in the forest (Noss et al. 2006, Johnson 2007). Whether restoration should focus on ecological processes (e.g., fire), or re-establishing forest structure, to reincorporate natural disturbance processes in managed ecosystems, continues to be debated (Stephens and Moghaddas 2005). However, in the meantime, dry old growth forest types are at high risk from wildfire, due to increasingly dense understories composed of drought- and fire-intolerant species that have created ladder fuels, as well as increases in ground fuels and in main canopy densities (Agee and Skinner 2005, Hessburg et al. 2005, Noss et al. 2006, Spies et al. 2006, Abella et al. 2007, Brinkley et al. 2007, Egan 2007, Fiedler et al. 2007a, Johnson 2007).

Management options for creating or restoring a fire-resilient forest structure within the drier forest types includes the reduction of surface and ladder fuels and canopy bulk density and the maintenance of large thick bark trees in the stand (Agee and Skinner 2005). All of these structural characteristics significantly changed after decades of vigorous fire exclusion, which was facilitated by a moderate climate between 1930 and 1980 (Morgan et al. 2008). Several studies show that increasing forest resilience can be accomplished with various silvicultural treatments (Fiedler 2002, Agee and Skinner 2005, Stephens and Moghaddas 2005, Metlen and Fiedler 2006, Youngblood et al. 2006, Fettig et al. 2008, Ritchie et al. 2008, Zhang et al. 2008, Fulé et al. 2012). Specifically, thinning combined with prescribed underburning, compared with no treatment, was considered the most effective strategy, while prescribed burning alone could scorch and kill many of the old trees intended for retention (reviewed in Kolb et al. 2007, Ritchie et al. 2008).

The desired result of developing resilient old growth conditions through management techniques is to meet restoration objectives while maintaining composition and structure that conforms to the Green et al old growth definition (Green et al. 1992). Based on the current literature, this approach to maintaining resilience in old growth ecosystems has been incorporated into all the action alternatives (e.g., Hawe and Delong 1997, Fiedler 2000b, Quesnel and Steeger 2002, Steeger and Quesnel 2003, Briana et al. 2004, Lindh and Muir 2004, Sala and Callaway 2004, Spies et al. 2006, Kolb et al. 2007, Ritchie et al. 2008, Zhang et al.2008, Elzinga and Shearer 1997, Arno et al. 1997, Harrington 2007, Erickson et al. 2008).

Snags

Snags (standing dead trees) are ecologically important for a number of reasons. They are important habitat structures (for nesting, feeding, perching, and/or roosting) for a wide variety of wildlife species. They provide substrate for some mosses and lichens and also serve to improve environmental conditions on harsh sites. Once they fall, snags become down wood that provide other habitat structures (including den sites) for a different and very wide suite of wildlife species and some plant species. Down wood is also critical for nutrient cycling, moisture retention, providing effective microsites for tree regeneration, diversity of soil micro-organisms, and hydrologic function. Snags are short-term and vary greatly throughout the life cycle of a forest stand. If a stand originates following a fire, the resulting young stand may begin under a high number of snags. Most snags only remain standing for a few years, but can remain standing up to a few decades. How long these snags remain standing is a function of the species, size, age, and site factors like soil characteristics, slope position, and landscape position. An insect or disease outbreak may rapidly increase the number of snags. A severe windstorm may rapidly reduce the number of snags (while increasing the amount of down wood). Root pathogens may provide gradual input of snags until all the trees are killed. Depending upon the particular pathogen, these snags may not remain standing for very long. Various severe weather conditions may serve either to increase or decrease snag numbers.

In order to quantify and otherwise describe the amount of snags on the IPNF, an analysis was recently completed using FIA information collected on the Forest (Bollenbacher et al. 2009). Table 12 provides a summary of the estimated average number and size distribution of snags per acre that occur across the forested areas of the IPNF. The information is separated by Dominance Group, Habitat Type Group, and three snag sizes. The three Habitat Type Groups correspond very closely to the Biophysical Settings (warm/dry, warm/moist, and subalpine) presented earlier. The Lodgepole Pine Dominance Group was separated from the other Dominance Groups in the analysis since lodgepole pine trees do not grow as large as the other common tree species because of their growth form and high stocking levels, and typically do not contain as many large snags.

Snag numbers decrease substantially in the larger size classes across all Habitat Type Groups and Dominance Groups (table 12). The Low-Mid Elevation-Moist group has the highest average snag densities across all snag classes. This is likely due to the presence of higher productivity sites and because of the specific fire regime typical on these sites compared to the other Habitat Type Groups. That is, a longer interval between stand-replacing fires occurs while mixed-severity fires occur in-between the stand-replacing events.

Table 12. Average Snags per Acre for the entire IPNF by Dominance Group, Habitat Type Group, and Snag Sizes Classes

Dominance Group	Habitat Type Group	Snags per Acre 10"+	Snags per Acre 15"+	Snags per Acre 20"+
All except Lodgepole pine	Dry	9.4	3.9	1.1
	Low Mid Elev-Moist	13.5	4.7	1.9

Dominance Group	Habitat Type Group	Snags per Acre 10"+	Snags per Acre 15"+	Snags per Acre 20"+
	Subalpine	11.2	3.3	1.1
Lodgepole Pine	All Settings	9.0	1.7	0.5

Data in this table is a summary of the more detailed information within table 5 of appendix C in Bollenbacher et al.2009. Confidence intervals and the number of sample plots per strata are available in that document.

To determine historic snag densities, the snag analysis (Bollenbacher et al. 2009) separated the forest inventory data into two categories; areas that occurred in wilderness or roadless areas, and the rest of the Forest. The assumption was that snag levels and distribution patterns in the wilderness/roadless areas provide a better "picture" of historic snag conditions, and represent the best available information as to the historic range and distribution of snags. This information was then used to establish desired future conditions and forest plan guidance. Although fire suppression activities may have influenced snag conditions in the wilderness/roadless areas in a number of ways, the effects are difficult to predict (Bollenbacher et al. 2009, Harris 1999). In a recent snag study (Harris 1999) that took place in western Montana, Harris considered how fire suppression activities may have influenced snag levels in areas that had no harvest history. Harris stated that predicting the likely effects was complex and uncertain. However, he did conclude that existing snag densities in his study area may be about 10 percent higher than historical levels.

Average snag densities for wilderness/roadless areas and the other forested lands are displayed in table 13. As this table indicates, in two of the three snag classes the average snag quantities are slightly more for areas that are outside of wilderness/roadless areas, than for areas within wilderness/roadless areas. The likely explanation for this is that current stands were created from large wildfires that occurred on the IPNF (e.g., the 1910 and 1926 fires) are in a mid seral stage of succession, and a greater percentage of those stands are located in wilderness/roadless areas than they are outside of the wilderness/roadless areas. However, even though the average snag densities are greater for two of the size classes outside, when one compares the confidence intervals surrounding those averages, the differences are not statistically significant.[1]

[1] This is illustrated in table 2 of Bollenbacher et al. 2009.

Table 13. Average Snags per Acre on the IPNF for Areas within Wilderness/Roadless Areas and for the Areas outside of those Designations

Area	Snags per Acre 10"+	Snags per Acre 15"+	Snags per Acre 20"+
In Wilderness/Roadless Areas	10.4	3.7	1.6
Outside of Wilderness/Roadless Areas	12.7	4.2	1.4

Data in this table is a summary of the more detailed information within table 2 in Bollenbacher et al. 2009 Confidence intervals and the number of plots per strata are available in that document.

Table 14 below displays the range and average number of snags that occur in the wilderness/roadless areas on the IPNF by Habitat Type and Dominance Groups. These snag densities were utilized as the desired amounts in the revised Forest Plan.

Table 14. Snag Density Ranges and Averages for Wilderness/Roadless Areas on the IPNF by Habitat Type and Dominance Groups (average snags are displaced in parentheses)

Dominance Group	Habitat Type Group	Ranges of Snags per Acre by Diameter Class		
		10"+	15"+	20"+
All except Lodgepole pine	Dry	4.1-13.2 (9.4)	0.5-6.4 (3.9)	0.4-2.2 (1.1)
	Low Mid Elev-Moist	8.6-15.9 (13.5)	2.9-6.3 (3.9)	1.3-3.0 (1.9)
	Subalpine	7.2-14.0(11.2)	2.2-5.3 (3.3)	0.6-2.3 (1.1)
Lodgepole Pine	All Settings	1.8-13.7 (9.0)	0.3-4.4 (1.7)	0.1-0.7 (0.6)

Data in this table is from the IPNF portion of table 11 in Bollenbacher et al. 2009

As found in both Bollenbacher et al. (2009) and Harris (1999), the distribution of snags across the landscapes in both northern Idaho and western Montana is very clumpy, or uneven. For example, when analyzing snag distributions on several national forests in northern Idaho (Idaho Panhandle, Nez Perce, and Clearwater National Forests), Bollenbacher et al. (2009) found that the percent of FIA plots having any snags occurring on them, varied from approximately 5 to 4 percent, depending upon the habitat type, Dominance groups, and snag class.[1] The conclusion is that over much of the area, there are no snags, while other areas have numerous snags. The primary reason for this uneven distribution of snags across the landscape is simply that many snags are created as a result of periodic, broad-and fine-scale disturbances such as fire, insects, and diseases; and these disturbances do not occur evenly across space.

Bollenbacher et al. (2009) also looked at how snags and live tree densities varied across different seral stages of forest development. This analysis was used to determine the appropriate levels for retention of snags and live snag recruitment for vegetation treatments. In the analysis, size class was used to approximate seral stages. Areas that were dominated by trees that were 0.0-9.9 inches in diameter (up to 30 years old) were considered early-seral, while areas dominated by 10.0 -19.9 inch diameter trees were considered to be in a mid-seral stage. Finally, areas dominated by trees 20.0 inches and greater were considered to be in the late-seral stage (generally 130 or more years old).

[1] See table 9 in Bollenbaucher et al. (2009) for more details

Table 15 illustrates the ranges and average number of snags and live trees that occur within each of the three seral stages by Habitat Type and Dominance Groups. Information in that table is for wilderness/roadless areas across all of the northern Idaho national forests. This information was used to develop the snag guideline in the revised Forest Plan that indicates how many snags and live trees (for future snag recruitment) should generally be left in areas that have vegetation management activities conducted in them.

Table 15 Snags and Live Trees per Acre Ranges by Seral Stage and Diameter Class

Dominance Group	Habitat Type Group	Ranges per Acre in *Early-seral* Conditions		
		Snags > 15"+ DBH	**Snags > 20.0" DBH**	**Live trees > 15.0" DBH**
All Other Groups	Dry	2.1-4.2 (3.1)	0.9-1.8 (1.3)	0.3 -3.0 (1.4)
	Low and Mid Elevation Moist	4.3-6.7 (5.5)	2.2-3.5 (2.9)	1.1 -5.6 (3.1)
	Subalpine	3.2-5.0 (4.1)	1.0-1.8 (1.4)	1.1 -3.6 (2.6)
Lodgepole Pine	All	0.9-2.4 (1.6)	0.1 -0.7 (.4)	0.7 – 3.2 (1.8)
Dominance Group	**Habitat Type Group**	**Ranges per Acre in *Mid-seral* Conditions**		
		Snags > 15"+ DBH	Snags > 20.0" DBH	Live trees > 15.0" DBH
All Other Groups	Dry	2.0 -5.0 (3.4)	0.8 -2.1 (1.3)	20.7 – 32.5 (26.4)
	Low and Mid Elevation Moist	3.8 -6.6 (5.2)	1.9 -3.4 (2.6)	26.2 – 34.1 (30.1)
	Subalpine	3.0– 5.0 (4.0)	0.9 – 2.0 (1.4)	19.7 – 25.5 (22.6)
Lodgepole Pine	All	1.1 -3.4 (2.2)	0.2 -1.1 (0.5)	10.8 – 18.8 (14.6)
Dominance Group	**Habitat Type Group**	**Ranges per Acre in *Late-seral* Conditions**		
		Snags > 15"+ DBH	Snags > 20.0" DBH	Live trees > 15.0" DBH
All Other Groups	Dry	2.4 -6.2 (4.2)	1.3 -3.4 (2.2)	18.8 -32.5 (25.4)
	Low and Mid Elevation Moist	6.0 -12.3 (8.9)	3.4 -6.9 (5.1)	32.3 -47.2 (39.6)
	Subalpine	4.6 -11.3 (7.7)	1.7 -4.3 (2.9)	23.0-45.0 (33.5)
Lodgepole Pine	All			

Estimated mean for each range is displayed in parentheses. Seral stage is based on Stand Size as derived by basal area weighted average diameter: early-seral = 0.0 – 4.9" average diameter; mid-seral = 5.0" – 14.9" average diameter; late-seral = 15.0" + average diameter

Information in this table was taken from table 12 in Bollenbacher et al. 2009.

The desired snag quantities and sizes are provided in the revised Forest Plan by biophysical setting, Dominance Group and size class. The desired condition over the Forest approximates the conditions in table 14 (see above) that currently occur in the roadless/unroaded areas.

Forest Density

The density of forest vegetation can influence everything from the health and vigor of individual trees in a forest stand to the composition of plant species in the community, which affects whether or not the stand is suitable habitat for certain wildlife species. Tree density also affects the susceptibility of the trees to drought, insects and diseases, wildfires, and other disturbance events, as well as influencing the rate of plant succession. While it is difficult to quantify historical forest densities, general inferences can be made based on the knowledge of historical disturbance regimes and forest succession.

As discussed in the “Wildfire” disturbance section, the success of fire suppression has had a large influence on the structure and composition of forest conditions. Research has shown that fire suppression for the last several decades has led to increased density of stands as well as additional canopy layers (Keane et al. 2002, Hessburg et. al. 2005). Fire exclusion has led to stands that are much denser than occurred historically.

There are a number of key ecological concerns with the trend of increasing forest density. In general, the denser the forest the greater the likelihood that fuel characteristics could support a fast moving intense crown fire. This is not only a result of greater fuel quantities in a dense forest, but also of the vertical and horizontal continuity of fuels. On most of the sites where fire suppression and other factors have led to increased forest densities, not only has the number of trees per area increased, but so has the number of canopy layers in a given stand. This has increased the continuity of vertical fuels. The lower tree and tall shrub canopies serve as ladder fuels to increase the likelihood of a surface fire moving upwards to become a crown fire.

The susceptibility of a forest to insects and diseases is heavily influenced by density and its impact on tree vigor. As the density increases, a deficit of soil moisture develops and trees lose their ability to withstand attacks by insects, pathogens, and parasites (Powell 1999, Safranyik et al. 1998). Density-related tree mortality from insects, diseases, and competition leads to increased dead fuel quantities and higher fuel hazards.

Another concern regarding the trend of increasing forest density is its influence on the more desirable tree species that are intolerant of shade. Western larch and ponderosa pine are very intolerant of shade. In a stand with mixed species, as the density of more shade-tolerant species (e.g., Douglas-fir, grand fir, hemlock, and cedar) increase, the larch and ponderosa pine will likely die out (unless a disturbance reduces the competition from the shade-tolerant species).

Climate change may compound the effect of dense forests on the soil water balance. In general, the soil water balance (especially in the summer drought period) determines which tree species can ultimately survive on a specific site. Seral tree species (e.g., ponderosa pine and western larch) have the unique ability to establish on bare soil surfaces where high surface temperatures exclude other species. One of the adaptations of these seral species are deep rooting characteristics that allows the tree to find an adequate water supply and avoid extensive competition with shallow and fibrous rooted grasses and forbs. As the shade from these seral tree species limits grasses and forbs, shade-tolerant tree species can become established in understories. These shade-tolerant species have shallower rooting characteristics that allow them to gather soil water from near the soil surface. The overall rooting structure on the site becomes much more competitive for water resources as succession progresses. As the density of the stand and the amount of leaf area increases, water transpiration increases and this can deplete the water that is stored in the soil throughout the summer. The additional forest canopy interception of rain and snow further compounds the reduction in soil water recharge. This results in a water-stressed forest that not only becomes more susceptible to insect and disease, but also more prone to supporting severe wildfires because live fuel moisture is relatively low.

Landscape Patterns of Forest Conditions and Disturbance Implications

To understand how forest ecosystems function and how management activities could affect them, it is important to consider the pattern of forests on the landscape. The pattern of a forest can affect numerous ecological processes, including: watershed functioning; wildlife habitat and dispersal; plant habitat and dispersal; disturbance (fire, insects, and pathogens) risk, spread and size; ecosystem response to disturbance; and human esthetic values. The numerous ecosystem services that forests provide are heavily influenced by the spatial patterns that exist on the landscape (Turner et al 2012).

The historic and current forest pattern of size classes on the IPNF was analyzed through the use of a spatial pattern analysis model called FRAGSTATS. This model was used to quantify the extent and spatial configuration of forest "patches" within a landscape. Patches were identified and then classified into tree size classes. The model then calculated a number of spatial metrics. The methods used for the analysis are described in appendix B of this EIS.

Relative to the historical conditions, the following conclusions were made regarding how the spatial pattern of structural conditions has changed over representative landscapes on the IPNF. Forest stands in the smallest size class, as well as those in the largest size class, changed in similar ways. The area covered by both of these size classes declined from historical levels (see figure 8 above). The FRAGSTATS analysis also indicated that the average patch size of stands in these size classes decreased substantially. The smaller-sized patches have an increase in edge and decrease in interior habitat; therefore, these types of patches have become more fragmented. In addition, the size of these patches became less variable. Although the average patch size for both the smallest size class as well as the largest size class showed similar trends, the magnitude of the changes were generally greater for the largest size class.

Changes that have occurred to the medium size class have generally been in the opposite direction to those described above. The medium size class became a larger percent of the landscape and the average patch size generally became much bigger. In addition, the patch sizes became more variable.

The FRAGSTATS analysis concluded that overall, there has been a homogenization and simplification of landscape patterns for forest structure. Landscapes have increasingly become dominated by large patches of medium size trees and there is less variability in internal structure or composition of these medium size patches. Meanwhile, the patches of the smallest and largest size classes are fragmented into smaller patches with more edge and less interior area.

Other assessments have been conducted to investigate how the pattern of other forest characteristics (e.g., forest cover types, crown cover, snags, tree density, etc.) has changed over time, and how those changes may have influenced the susceptibility of the forests to insect and disease disturbances. For example, as part of the ICBEMP effort, a midscale assessment was conducted to determine how the cumulative changes in forest composition, structure, and pattern have affected the vulnerability of the forests to insects, diseases, and wildfires (Hessburg et al. 1999, Hessburg et al. 2000). As part of that assessment, several subwatersheds that occur on the IPNF (Pend Oreille and Upper Coeur d'Alene) were analyzed. Conclusions made that are applicable to those watersheds regarding how the landscapes patterns have changed regarding insect susceptibility include:

- Areas dominated by lodgepole pine forests have aged and become more synchronous in their vulnerability to mountain pine beetles and fires;

- The lodgepole pine exhibited larger tree size, poorer crown differentiation, higher crown cover, and greater contiguity of those characteristics;
- There are greater areas vulnerable to fir engraver bark beetles and;
- The area and connectivity of forests that is vulnerable to spruce beetles has increased.

For root diseases, the changes in the forests have generally increased the vulnerability to armillaria, annosum, and laminated root diseases (as well tomentosus and butt rots). With regard to wildfires and smoke production, changes to forest conditions were such that a larger percentage of the landscapes would burn with greater intensities and produce more smoke than historically. The fuel loading, predicted fuel consumption, and expected smoke production estimates generally increased as did the intensity, flame length, and crown fire potential. However, Hessburg et al. (2000) concludes that management activities have not made entire landscapes prone to uncharacteristic wildfires, but rather they have removed the spatial isolation that patches of forests prone to stand replacement fires once exhibited.

Changes to the landscape pattern have occurred largely as a result of a cool phase of the Pacific decadal oscillation between 1940 to 1980 (which helped make fire suppression effective until the warm phase of the Pacific decadal oscillation became dominate in the late 1980s through 2007). There is a growing body of evidence that the types of changes to landscape patterns and conditions discussed above have increased the susceptibility of the forests to larger and/or different kinds of disturbances, especially when considered in light of the potential climate change affects.

Bark beetle outbreaks generally occur in areas where there is a large expanse of forest with fairly homogenous conditions of host tree species of a susceptible age/condition (Fettig et al. 2007, Samman and Logan 2000). On portions of the IPNF, the hazard of significant mortality from either mountain pine beetle or Douglas-fir beetle is fairly high as a result of having these conditions. For these bark beetles (as well as other species), the severity of outbreaks and tree mortality can be reduced in extent by increasing the diversity of stand ages, size classes, and tree species in landscapes that are homogenous (Bentz et al. 2010, Bollenbacher 2010, Fettig et al. 2007).

As the fuels and forest structures have homogenized over the landscapes, the potential for large, high-intensity wildfires has increased, and climate change effects will likely exasperate this trend (USDA Forest Service 2010b). Research has shown that the spread of wildfires and the potential for large fire growth across a landscape can be limited by reducing fuel continuity (Ager et al. 2010, Collins et al. 2008, Finney and Cohen 2003, Finney 2007, Hessburg et al. 2007 Safford et al. 2009, Stephens et al. 2009). In addition, large landscapes (e.g., wilderness areas) where wildfires have been allowed to burn can develop fuel heterogeneity; therefore, future fires could be limited in size relative to other landscapes that have more homogeneity in fuel conditions (Bollenbacher 2010, Collins et al. 2008, Rollins et al. 2002, and van Wagtendonk 2004). In addition, patterns of old burns can delay and detour the spread of new fires.

Promoting Resistance and Resiliency to Disturbance and Stress Agents

Numerous changes have occurred to the forests on the IPNF relative to historical conditions. To various degrees and in different ways, these changes have affected the composition, structure, landscape pattern, and ecological processes. These altered conditions have predisposed the Forests to new levels and types of disturbances (e.g., uncharacteristic fires as well as both native and non-native insects and diseases). From the perspective of maintaining biodiversity and healthy forest ecosystems, these trends are not desirable. In addition, future climate change will add to the list of existing forest “stressors.”

Forest ecologists and other scientists are increasingly noting that “resistance” and “resilience” are important concepts as they relate to sustainability, biodiversity, and climate change (Blate et al. 2009, Drever et al. 2006, Folke et al. 2004, Hansen et al. 2003, Joyce et al. 2008, Millar et al. 2007, Noss 2001, Stephens et al. 2010, Thompson et al. 2009, Unnasch et al. 2009, Walker et al. 2004, Walker and Salt 2006). Resistance refers to the capacity of ecosystems to tolerate disturbances without exhibiting significant change in structure and composition, while resilience refers to the ability of a system to recover from disturbance in the event that the disturbance exceeds the capacity of the system to resist changing (Holling 1973). To improve adaptation of forest vegetation to the likely effects of climate change, these same researchers suggest promoting resistance and resiliency. Reducing the impact of current stressors has been called a “…no regrets adaptation strategy that could be taken now to help enhance ecosystem resilience to climate change, at least in the near term” (Joyce et al. 2008). Joyce goes on to explain that “[e]fforts to address the existing stressors would address current management needs, allow an incremental approach that begins to incorporate climate into management and planning, and potentially reduce the future interactions of these stressors with climate change.”

Adaptations options are presented in the KIPZ Climate Change Report (USDA Forest Service 2010b), “…emphasize management actions that address existing stressors, contribute to multiple land management objectives regardless of climate change (win-win), and are likely to be effective at achieving or maintaining desired conditions across a wide range of future climates. Their application in appropriate circumstances may be a critical contribution to sustaining the health, diversity, and productivity of the IPNF to meet the needs of present and future generations.” One of these options is to:

> Increase the resilience of forest vegetation by reducing the potential severity of wildfire and insect outbreaks. Managing the density of trees can improve forest resiliency by reducing water stress, decreasing susceptibility to insect and disease mortality, and decreasing the likelihood of stand-replacing wildfires. Management actions that increase the diversity of stand ages, size classes, and tree species in currently homogenous landscapes can reduce the extent and severity of bark beetle outbreaks and wildland fires. Mechanical treatments, prescribed fire, and managing wildland fires for resource objectives are all potential tools for increasing the resiliency of forest vegetation to climate and other stressors. In addition, existing programs to reduce the vulnerability of whitebark pine and western white pine to white pine blister rust will also improve the resistance of these species to the added stresses associated with climate change.

When developing the goals, desired future conditions, objectives and standards in the revised Forest Plan that pertain to forest vegetation, the concepts and management approaches discussed above regarding forest resistance and resiliency were utilized with the overall objective of maintaining and restoring the Forests biodiversity and sustainability. In discussions in this EIS regarding forest vegetation, we consider that a resilient forest ecosystem contains the diversity of composition, size, density, and pattern to enable it to cope with disturbance and to perpetuate itself through periodic regeneration.

Carbon Sequestration

Carbon sequestration is the process by which atmospheric carbon dioxide is taken up by vegetation through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils. Forests also release carbon dioxide to the atmosphere as a result of respiration and decay of dead wood, litter, and organic matter in soils. In addition, forest fires release some stored carbon into the atmosphere in the combustion process, and insect outbreaks, fires, pathogens, drought stress, and wind storms kill trees and increase the amount of biomass available for decomposition by microorganisms. Timber harvesting removes carbon from the forest, although some of it is stored in wood products or used to produce energy – displacing fossil fuel use.

Sequestering carbon in forest ecosystems can help to offset sources of carbon dioxide to the atmosphere, such as deforestation, forest fires, and fossil fuel emissions. Interest in carbon sequestration has increased in an effort to explore opportunities for climate change mitigation. The KIPZ Climate Change Report (USDA Forest Service 2010b) provides a substantial amount of information on how terrestrial vegetation and disturbance processes can affect carbon cycles as well as forest productivity. The IPNF and KNF contribute approximately six tenths to eight tenths of 1 percent of the total U.S. forest carbon "reservoir." Estimated carbon stocks on forested areas of the IPNF are approximately 177 million metric tons. In addition, preliminary estimates indicate that the forests on the IPNF and KNF currently serve as a net carbon sink, removing approximately 27 to 31 metric tons of carbon per acre per year. Harvested wood products increase the net sequestration on those forests by an undetermined amount. See the KIPZ Climate Change Report, for more detailed information on carbon sequestration.

On the IPNF, carbon stocks will vary over coming decades in response to complex and uncertain interactions between climate variability and change, age structure, disturbance-recovery processes, and possible effects of carbon dioxide concentrations on forest productivity. High severity fires or large scale tree mortality from bark beetles will affect the amount of carbon sequestered by the IPNF. An increase in root disease, with its associated limitation on the growth of stands, could lead to a reduction in the ability of the Forest to store carbon. In addition, timber harvesting will affect amount of carbon stored and the short-term net flux of carbon with the atmosphere.

Desired and Current Vegetation Conditions for Each Biophysical Setting

As described earlier, the IPNF are comprised of three major biophysical settings: Warm/Dry; Warm/Moist; and Subalpine. Following is a description of the vegetation condition for each biophysical setting. The desired condition is first described in a narrative format for each setting and then the current forest composition and structure is compared to the desired condition using Dominance Groups and size class figures.

Warm/Dry Composition, Structure, and Pattern

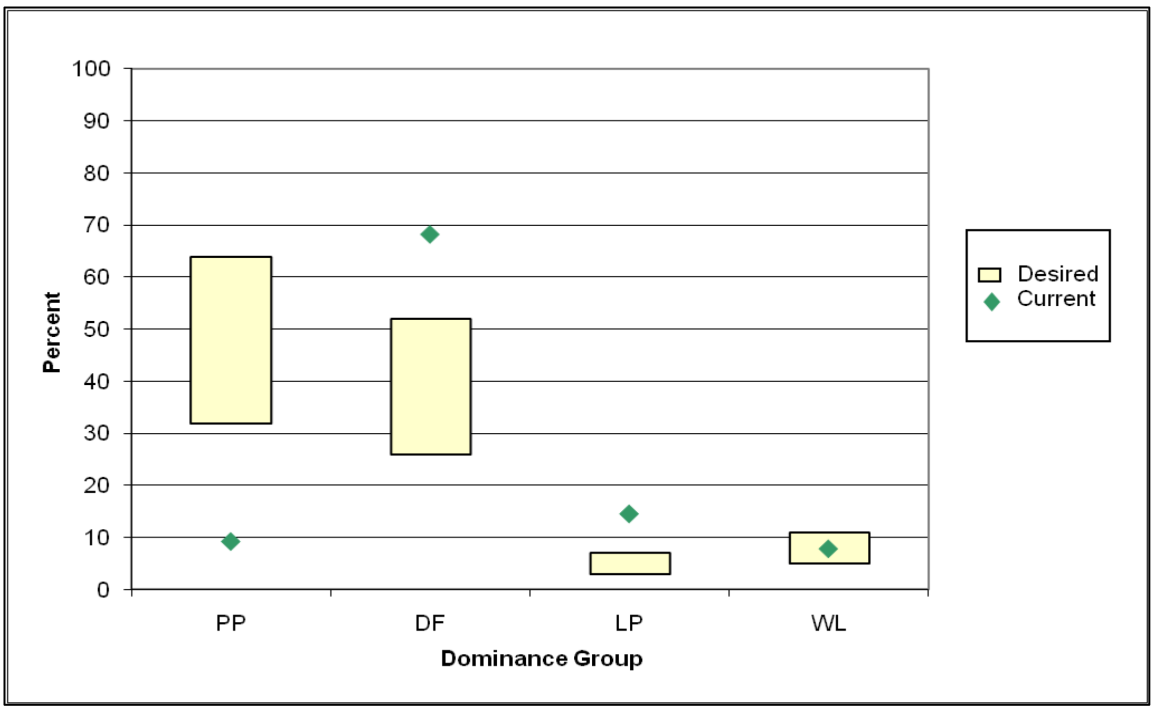
This biophysical setting includes the warmest and driest forest sites that support forest vegetation. These sites cover approximately 15 percent of the IPNF forested lands and occur either at low elevations, at mid-elevations on southerly aspects, and/or on droughty soils (figure 6).

On the driest sites in this setting (vegetation response unit 1 and the south and west aspects of 2), the stands are generally open-grown, park-like stands that contain abundant large-diameter ponderosa pine and lesser amounts of large-diameter Douglas-fir. Openings are generally less than five acres and occur within 20 to 200 acre patches. Stands are usually multi-aged and have a low tree density of 5 to 30 large mature trees per acre that are irregularly spaced in the stand.

On the moister sites within this setting (vegetation response unit 3 and north and east aspects of 2), species composition varies with mixed Douglas-fir-western larch-ponderosa pine stands more prevalent on the moist end, and mixed ponderosa pine-Douglas-fir stands occurring on drier sites. At maturity, densities of trees generally vary from 15 to 60 trees per acre. However, on the moister sites, the tree density can exceed 100 trees per acre. The pattern for these landscapes is a mosaic with small to moderate size openings (less than 5 acres up to 10 acres) within larger patches (50 to 200 acres).

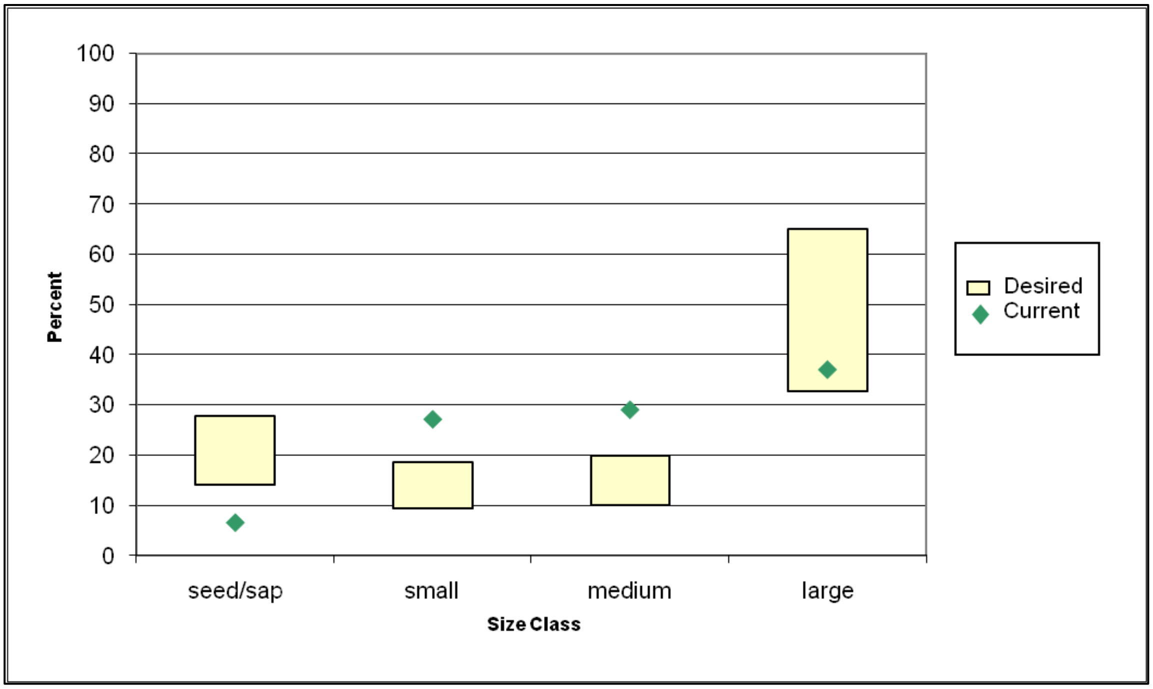
The pattern of successional stages in this warm/dry setting is such that fire or insects and diseases do not dominate the landscape at any one time. As the Forest trends towards the desired conditions, uncharacteristic levels of bark beetles, root disease, and fire intensity, decrease over time.

Figure 10 shows current species composition and desired ranges for the dominance groups found in this biophysical setting. As indicated in figure 10, ponderosa pine is well below desired conditions, while Douglas-fir and lodgepole pine are above. The desire is to increase the amount of ponderosa pine and decrease Douglas-fir and lodgepole pine.



PP = ponderosa pine; DF = Douglas-fir; LP = lodgepole pine; WL = western larch

Figure 10. Desired and Current Forest Composition by Dominance Group for the warm/dry Biophysical Setting



(seed/sap = 0-5” DBH trees, small=5-10” DBH trees, medium =10-15” DBH trees, and large =>15” DBH trees.)

Figure 11. Vegetation Desired Condition and Current Vegetation for Size Class for the warm/dry Biophysical Setting

Figure 11 shows current amounts and desired ranges of size classes for this biophysical setting. As indicated in figure 11, the seedling/sapling size class is well below desired conditions, while small and medium size classes are above. The desire is to increase the amount of seedling/saplings and large size classes while reducing the amount of small and medium size classes.

Warm/Moist Composition, Structure, and Pattern

This biophysical setting includes moist forest sites that are relatively warm. Approximately 61 percent of IPNF forested lands are within this biophysical setting. This setting includes low-elevation upland sites with deeper soils on north and east aspects, extensive mid-elevation moist upland sites, and most low-and mid-elevation wet stream bottoms and riparian benches and toe-slopes.

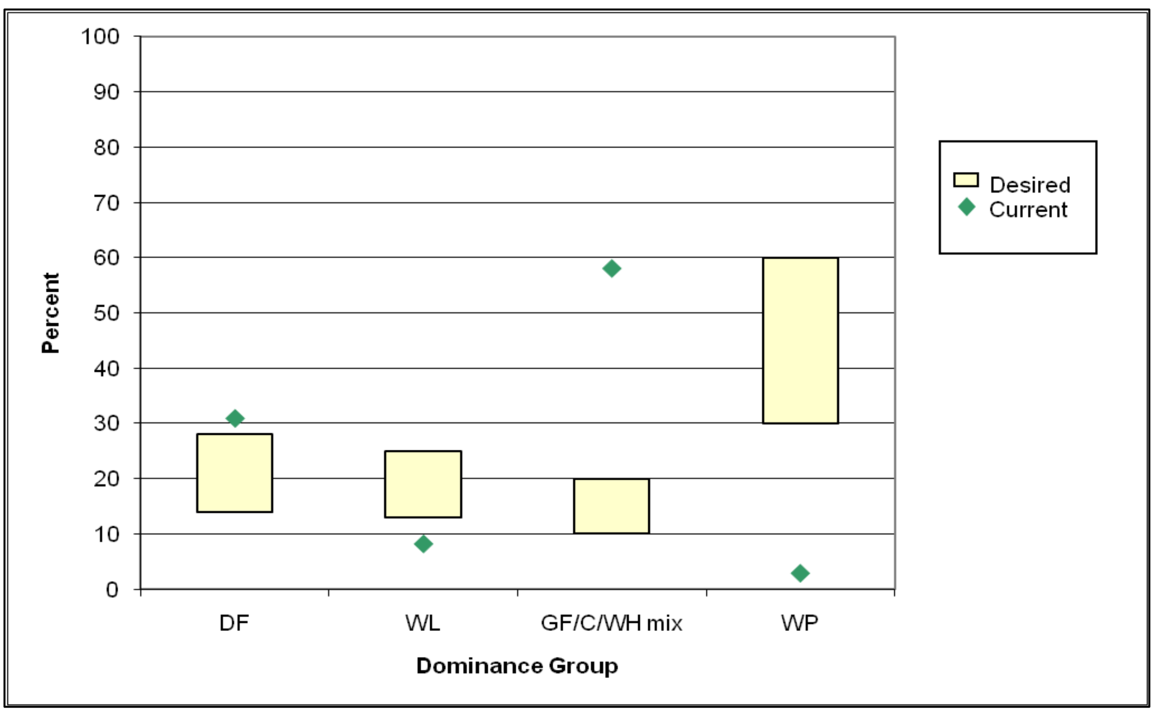
On the drier aspects, early-seral tree species such as western larch and western white pine, and in some cases Douglas-fir (where root disease risk is low), dominate throughout all successional structural stages. Other tree species occur in smaller quantities, including grand fir, and in cooler locations, Engelmann spruce and lodgepole pine. On the dry end on warm exposures and/or well drained soils, ponderosa pine is a seral component. Stands generally have either a single-age class or have two-age classes. Stands having two-aged classes resemble mixed-severity fire conditions, usually with fire-tolerant western larch and Douglas-fir in the overstory. At maturity, stands have approximately 100 trees per acre and have canopy coverage of 60 percent or more. Stands dominated by western larch have a lower density, with 40 to 70 trees per acre and canopy coverage of 30 to 40 percent.

In the moderately cool and moist uplands, forests include a mixture dominated by early-seral shade-intolerants (e.g., western larch, western white pine, lodgepole pine, Douglas-fir), with seral shade-tolerant species (e.g., grand fir, Engelmann spruce) and climax species forming a smaller proportion of the Forest. Single-and two-age class forests are desirable during early, middle-, and late-successional structural stages. Multi-storied forests increase in desirability when forests reach maturity. Desired stand density and canopy coverage are similar to desired conditions described above for the drier sites in the setting.

On wet sites, an abundance of large, old, mature forests occur and are often dominated by the climax western hemlock and western redcedar. High tree densities and canopy coverage of 70 percent or more exist through most successional structural stages. Mature stands support very large trees (often 30 to 50 inches in diameter), are open-grown and occasionally park-like in appearance, and are generally two- or multi-storied.

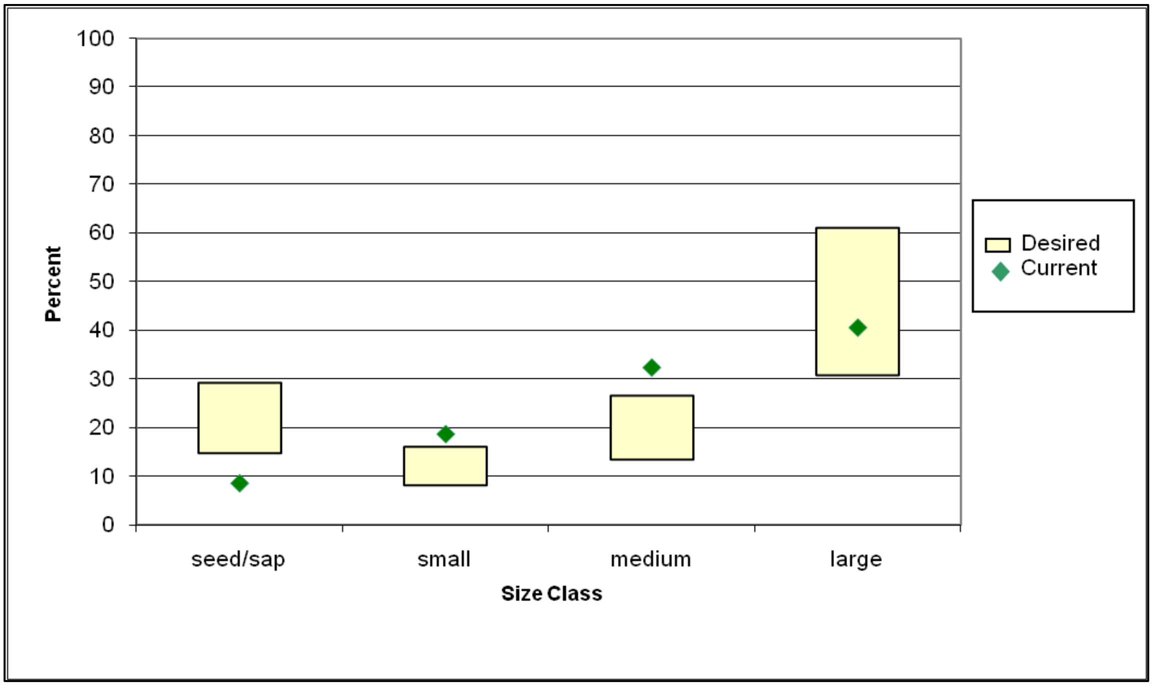
The resulting pattern for these landscapes is coarse and includes large, distinguishable patches, with residual structural diversity and heterogeneity both within and between patches. The pattern of successional stages is such that fire or insects and diseases do not dominate the landscape at any one time. As the Forest trends towards the desired conditions for this biophysical setting, uncharacteristic levels of root disease, bark beetles, and fire intensity would decrease over time.

Figure 12 shows current species composition and desired ranges for the dominance groups found in this biophysical setting. As indicated in figure 12, white pine is greatly under-represented while grand fir/cedar/hemlock is greatly over-represented. Western larch is also below and Douglas-fir above desired ranges. The desire is to increase the amount of white pine and western larch while decreasing Douglas-fir and grand fir/cedar/hemlock.



DF = Douglas-fir; WL = western larch; GF/C/WH mix = grand fir/cedar/western hemlock mix; WP = white pine.

Figure 12. Desired and Current Forest Composition for Dominance Group for the warm/moist Biophysical Setting



(seed/sap = 0-5" DBH trees, small=5-10" DBH trees, medium =10-15" DBH trees, and large =>15" DBH trees.)

Figure 13. Desired and Current Forest Structure by Size Classes for the warm/moist Biophysical Setting

Figure 13 shows current amounts and desired ranges of size classes for this biophysical setting. As indicated in figure 13, the seedling/sapling size class is well below desired conditions, while small and medium size classes are above. The desire is to increase the amount of seedling/saplings and large size classes while reducing the amount of small and medium size classes.

Subalpine Composition, Structure, and Pattern

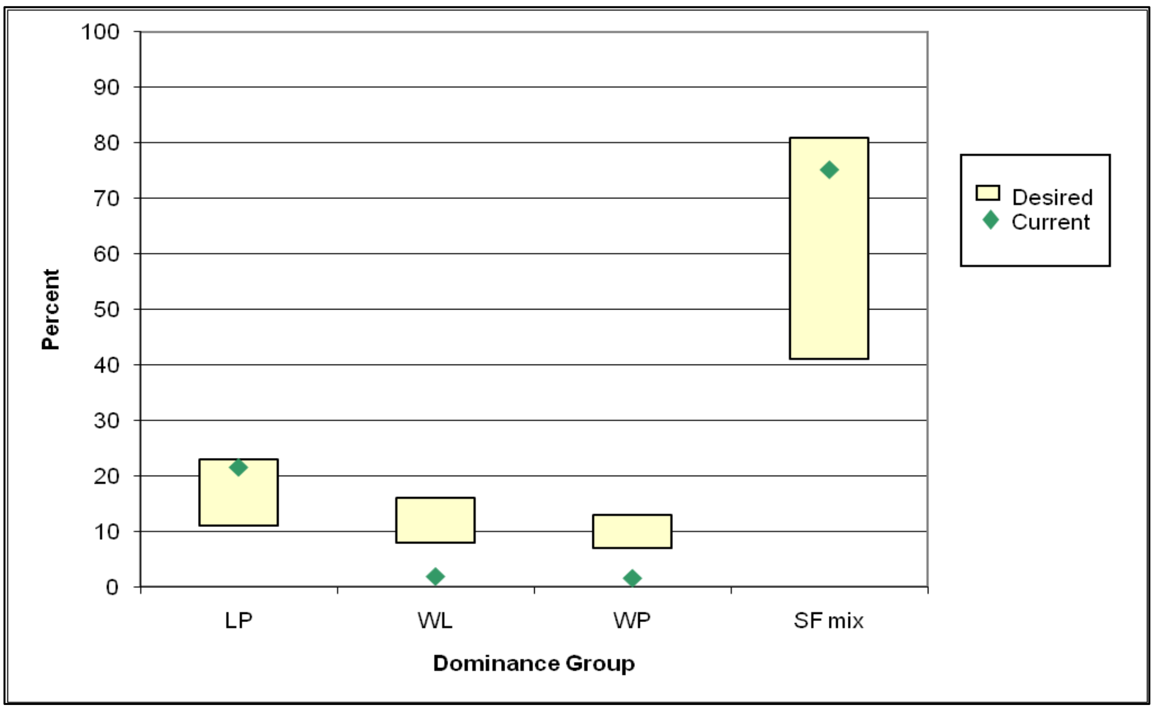
This biophysical setting occurs over approximately 24 percent of IPNF forested lands and occupies the higher elevations of the Forest. This setting ranges from the cool and moist lower subalpine sites, up to the cold and dry high elevation sites that have more open forests.

Western larch, western white pine, Engelmann spruce, and Douglas-fir are seral dominants, while lodgepole pine dominates areas less often in colder locations. Grand fir occurs on the warmer sites. Climax species, subalpine fir, and mountain hemlock also occur on cooler sites where fire-free intervals exceed the life span of lodgepole pine. Forests consist of two-aged forests (usually western larch/Douglas-fir in the overstory), and single-aged forests (seral mixed conifers, lodgepole, or spruce-dominated stands). Multi-aged stands are less common, but do exist with discrete age groups in older forests where several canopy layers exist. There are approximately 80 to 120 trees per acre at maturity and canopy coverage is 60 percent or more.

On high elevation sites in this biophysical setting, whitebark pine restoration efforts have increased the abundance of this species. Forests are low to moderate in density, and have conditions that would have been supported by mixed-severity fires. Other species include lodgepole pine, mountain hemlock, subalpine fir, and Engelmann spruce. Canopy coverage is generally less than 80 percent at maturity, much less at timberline sites. Forest conditions include numerous small openings (one-half to three acres in size) that are available for whitebark pine regeneration. Multi-aged stands are desirable, predominately occurring in discrete age-class groups. At the seedling stage, the desirable numbers include at least 100 trees per acre of whitebark pine that have some blister rust resistance, with 30 to 80 trees per acre at maturity. At the extreme timberline sites, trees grow in clusters.

The resulting pattern for these landscapes includes a variety of patch sizes, with residual structural diversity and heterogeneity both within and between patches. In some locations in this subalpine setting, there are existing homogenous patches of extensive lodgepole pine-dominated forests in the medium and large size classes. These forests are very susceptible to large bark beetle outbreaks and/or wildfires. The desired condition is that the pattern of these areas be diversified. The pattern of successional stages is such that fire, insect, or diseases do not dominate the landscape at any one time.

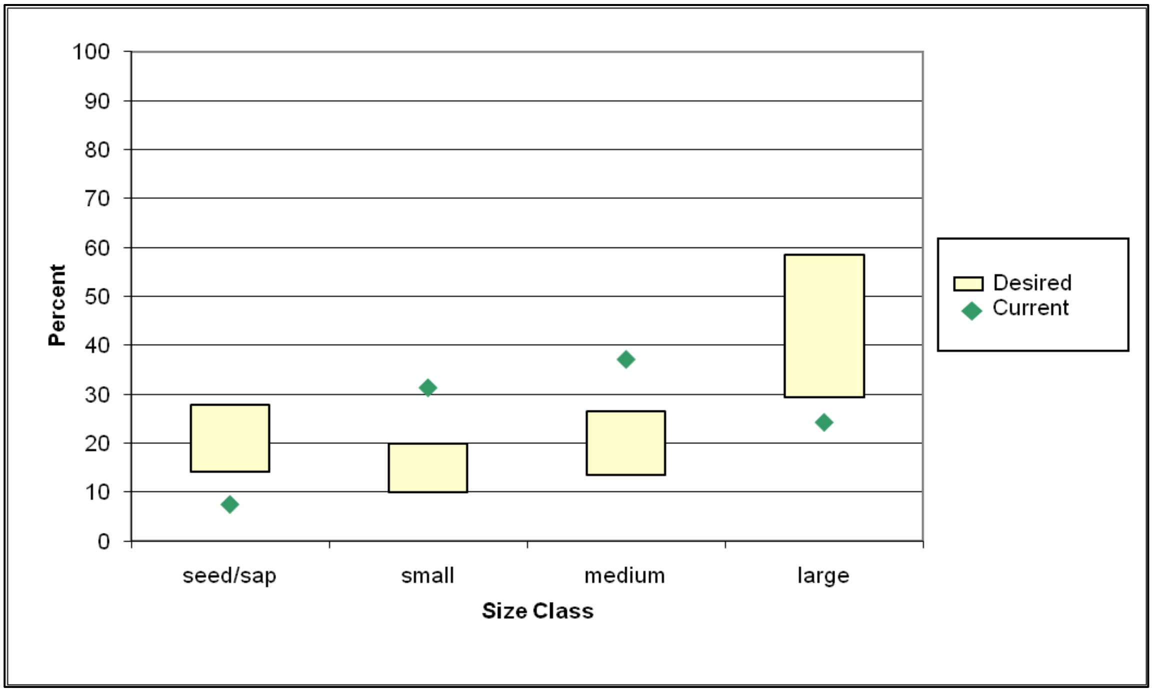
Figure 14 shows current species composition and desired ranges for the dominance groups found in this biophysical setting. As indicated in figure 14, western larch and white pine are under-represented while lodgepole pine and spruce/fir are at the high end of their desired range. The desire is to increase the amount of western larch and white pine while decreasing lodgepole pine and spruce/fir.



LP = lodgepole pine; WL = western larch; WP = white pine; SF mix = subalpine fir mix

Figure 14. Desired and Current Forest Composition by Dominance Group for the Subalpine Biophysical Setting

Figure 15 shows current amounts and desired ranges of size classes for this biophysical setting. As indicated in figure 15, the seedling/sapling and large size classes are below desired conditions, while small and medium size classes are above. The desire is to increase the amount of seedling/saplings and large size classes while reducing the amount of small and medium size classes.



(seed/sap = 0-5” DBH trees, small=5-10” DBH trees, medium =10-15” DBH trees, and large =>15” DBH trees.)

Figure 15. Desired and Current Forest Structure by Size Classes for the Subalpine Biophysical Setting

Environmental Consequences

Forest Vegetation

The following discussion focuses on describing how forest vegetation would be affected by implementing the different alternatives. More specifically, the effects to forest composition, structure, landscape pattern, resistance and resiliency to disturbances and stress agents, and carbon sequestration will be addressed. For each topic and alternative, the relevant management direction is first summarized followed by the effects.

Forest Composition and Structure

Management Direction

Alternative A — No-action Alternative

Alternative A would retain all of the 1987 Forest Plan direction regarding the management of forest vegetation. With regard to forest composition, the existing Forest Plan contains very little direction on the desired conditions for vegetation and management approaches to achieve them. One forestwide goal is to “Provide for a diversity of plant and animal communities” (goal #8, p II-1). Two forestwide objectives (item l on p II-8, and T, p II-10) and one standard (item #4, p II-32) discuss planting or other management of forest stands for seral tree species and mixtures as a way to minimize damage from forest insects and diseases. Individual MA prescriptions do not provide any additional specific direction.

The 1987 Forest Plan contains direction that addresses items related to forest structure. Most of this direction is either related to the desire of balancing the age class distribution of forest stands in order to regulate the timber yield and ultimately produce a sustained, even flow of timber products (e.g., forestwide goal #16, p II-2 and objective item l, p II-8), or the components are related to setting aside old growth stands for wildlife habitat or other values (forestwide objective item g, p II-5, forestwide standard #10, p II-29).

Regarding the management of old growth, the 1987 Forest Plan contains one forestwide standard (#10, p II-29) with nine separate items. That standard addresses such things as the definition of old growth, how much and what type of old growth is to be retained (also known as “allocated”), and what the distribution should be. One element of the standard (item #d) allows harvest of old growth in old growth management units that contain more than 5 percent of old growth, as long as the total is more than 10 percent on the Forest.

In addition to the old growth direction provided in the 1987 Forest Plan, in 1991 the forest supervisor of the IPNF provided the ranger districts with a letter of explanation describing how to implement the old growth standard (USDA Forest Service 1991). That letter provided very detailed instructions on the process to use for the identification and allocation of old growth stands. Using that information, the staff on the seven ranger districts went through a comprehensive exercise to inventory, map and allocate old growth stands for retention. At the time the 1987 Forest Plan was developed, it was believed that retaining 10 percent of the forested land on the IPNF as old growth would suffice to provide enough habitat to support minimum viable populations of wildlife species that were solely dependent upon old growth for their existence (USDA Forest Service 1987 (page IV-56) and USDA Forest Service 1983. While there may be some organisms that are truly dependent upon old growth, to date there are no documented cases of species that occur on the IPNF that are known to be solely dependent upon old growth stands.

While the IPNF has not removed old growth stands through harvesting for many years, the 1987 Forest Plan does allow it under certain circumstances. Given that the 1987 Forest Plan requires 10 percent of the forested land be maintained for old growth, and that the current inventory indicates that there is at least 10.8 percent (using the stand level map inventory) of old growth on the Forest, then theoretically the existing Forest Plan would allow the harvest of approximately 18,000 acres of old growth.

Regarding snags, one forestwide standard exists (item 7b, page II-28) for snag retention to provide habitat for cavity nesting species and one standard exists for the retention of large woody debris (forestwide standard 2, page II-33) for the maintenance of soil productivity. With one exception, individual MA prescriptions do not provide any specific direction on forest structure. The exception is that within the MA that contains lands suitable for timber production, the amount of stands to be retained for old growth is specified.

As described in a number of the 1987 Forest Plan components as well as the final EIS for that Plan, activities related to timber management (e.g., timber harvesting, tree planting, pre-commercial tree thinning) were envisioned as the primary means that would be used to encourage species diversity, create stands dominated by seral species, and minimize damage from insects and disease. Specifically, the 1987 Forest Plan indicated that timber management activities would be the primary mechanism to influence the structure of the Forest. For forest lands identified as suitable for timber production, the objective was to manage those timber stands (with the exception of some old growth stands) with a rotation age of 80 to 100 years (i.e., the stands would be regenerated by a harvest at an interval of between 80 and 100 years). Although most of the MA prescriptions in the Plan allowed the use of natural, unplanned ignitions to help achieve Forest Plan goals and objectives, that tool has seldom been used since the Plan was adopted.

In addition to the direction described above that is only applicable to Alternative A, the following Plan direction is common to all alternatives and could potentially affect forest composition and structure. The “retained existing Forest Plan direction” (see chapter 1 and appendix B in the revised Plan for more information on this direction) in the revised Forest Plan that could potentially affect the forest composition and structure includes the INFISH (USDA Forest Service 1995), Northern Rockies Lynx Management Direction (NRLMD) (USDA Forest Service 2007 March), and the Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones (USDA Forest Service 2011b and 2011c). All of this direction influences where vegetation management treatments can occur and/or what kind of treatments can be used. This includes the use of planned ignitions as well as natural, unplanned ignitions that are managed to meet multiple resource objectives.

Action Alternatives B Modified, C, and D

Alternatives B Modified, C, and D contain forestwide goals (Goal-01) and desired conditions for both forest composition (FW-DC-VEG-01) and structure (FW-DC-VEG-02, 03, 04, 07, and 08). Desired forest composition and structure conditions are also provided for each of the three biophysical settings. Additional desired conditions for forest composition and structure are provided at the geographic area scale to address unique condition for individual GAs.

These alternatives also have forestwide objectives (FW-OBJ-VEG-01), standards (FW-STD-VEG-01, 02) and guidelines (FW-GDL-VEG-01, 02, 03, 04, 05, and 06) designed to move vegetation towards desired conditions.

These alternatives contain direction as to the desired role that fire (both planned and natural, unplanned ignitions) would have in affecting the forest composition and structure. For example, at the forestwide scale, a desired condition (FW-DC-FIRE-03) and two objectives (FW-OBJ-FIRE-01, 02) emphasize the desire to have fire play an increased role in trending the vegetation towards the desired conditions. In addition, many of the individual MAs contain similar direction on the role of fire.

As discussed above under the no-action alternative, the applicable “Retained Existing Forest Plan Direction” contains direction that will influence management of forest composition and structure.

The old growth direction for these action alternatives is very different than it is for the No-Action alternative. For example, in contrast to the No-Action alternative, the action alternatives would not allow the removal (i.e., modifying the old growth stand characteristics to the degree that it no longer meets the old growth definition) of old growth stands through timber harvesting (see FW-STD-VEG-01). Rather, as opposed to the No-Action alternative, these action alternatives include direction (see FW-DC-VEG-03) to increase the amount of old growth on the Forest and to emphasize the development of the types of old growth that would be most resistant and resilient towards forest insects and diseases, wildfires, drought and other potential stressors such as climate change (e.g., ponderosa pine, western larch, western white pine and whitebark pine). Another difference between the 1987 Forest Plan and the action alternatives is that the action alternatives acknowledge that some management activities such as thinning and/or use of prescribed fire, could be used in certain old growth stands under certain circumstances to increase the resistance and/or resiliency of the stands to undesirable disturbances, such as stand replacing wildfire events or insect epidemics (see FW-GDL-VEG-01). The action alternatives recognize the tremendous ecological and social importance of ancient cedar groves (which are a special category of old growth). Unlike the 1987 Forest Plan, the action alternatives would not allow reducing these ancient cedar groves through harvesting or conducting other vegetation management activities in them (see FW-STD-VEG-02).

Regarding direction in the action alternatives that relates to road construction and old growth, the action alternatives contain more stringent direction that does the no-action alternative. The 1987 Forest Plan contains direction (Standard 10, item i) indicating that road construction should be avoided in old growth stands if doing so would be in conflict with the direction regarding the size of old growth stands. However, the action alternatives contain more limiting direction (see FW-GDL-VEG-02) that indicates that no temporary or permanent road construction or other developments would occur in old growth stands unless the road construction was needed to implement activities that were designed to increase the resistance and/or resilience of the stands to disturbances.

General Effects

Vegetation management activities for each alternative were formulated by considering the MAs, land suitability, multiple-use objectives, and the management requirements set forth in NFMA. The type and amount of vegetation management and the effect on vegetation composition and size classes was modeled using both SIMPPLLE and Spectrum. See appendix B of this EIS for a description of these models and Chew (2012), Henderson (2013) and Ecosystem Research Group (2012) for detailed information on methodology. The SIMPPLLE model was primarily used to predict how the forest vegetation would change over time given forest succession, disturbances (wildfire and insects and diseases) and the management activities (prescribed burning and various timber harvesting treatments) that were anticipated under the various alternatives. SIMPPLLE predicted how much wildfire would occur in the future given the current condition of the forest vegetation, the effect of the climate becoming warming and drier during the fire season, the impact of certain insects and diseases and the effect of management activities.

Among other things, Spectrum was used to determine how well the changes to the forest conditions would or would not meet the desired conditions given the different management emphasis for each alternative. Using Spectrum, a specific model was developed for each alternative, with management actions and objective functions varying based on the theme of the alternative. Alternative A was run with an objective to maximize timber production while Alternatives B Modified and C had objectives to move towards the desired forest composition (Dominance Groups) and structure (size classes) as quickly as possible, while meeting other resource constraints. Alternative D had an objective function to maximize timber and then to move towards the desired condition for vegetation. All solutions were finally run with an objective to maximize present net value to ensure economic efficiency in vegetation treatments.

The Spectrum models included management actions for timber harvest and prescribed burning (except in Alternative A). Prescribed burning was not included in Alternative A because it had no objective to move towards vegetation desired conditions. The models also included the amount of stand-replacing wildfire that was predicted from SIMPPLLE – approximately 40,000 acres per decade. For all of the forested areas, including where timber harvest or prescribed burning occurred as well as where those activities did not occur the models simulated general tree growth and mortality processes.

Several outputs were tracked by the Spectrum models, including dominance groups, size classes, snag density, fire and insect hazard, and carbon sequestration. Dominance groups and size classes were included as objectives for management while the other outputs were merely reported by the models.

The Spectrum model for each alternative was run twice. First it was run with a budget constraint, limiting timber harvest activities to what could be funded under current budget levels. The model was then run without a budget constraint to determine the amount of active management activities that could take place, given unlimited funds while meeting other resource constraints.

Several constraints were included in the Spectrum model to provide for other resource management concerns, operational limits, and NFMA requirements. See appendix B for a complete discussion of the model components.

Throughout this section, Spectrum results are shown for each alternative and when appropriate, SIMPPLLE results are summarized. Regarding Spectrum, it is important to note there are several limitations with the model. The model shows predicted changes given a set of assumptions, including the amount of stand-replacing wildfire and the effect of root disease on tree growth and mortality. The actual amount of stand-replacing wildfire and the amount and impact of root disease may be different from that modeled. Other natural disturbance, such as blowdown and drought were not included in the model. The model results are useful for understanding differences in alternatives and general trends in vegetation. Model results are not objectives for plan implementation but merely indicators of how vegetation may change over time based on management activities, an anticipated amount of disturbances (e.g., wildfire), and general forest successional processes. Results vary by alternative based on MA allocation, the theme of the alternative, and management intensity. For the remainder of the discussions regarding the Spectrum modeling results, the phrases “active management” or “actively managed” are used to denote acres that were simulated by the models to have either timber harvest or prescribed burning activities conducted on them.

Table 16 displays the estimated acres and the percent of the total acreage that were predicted to be actively managed during the first decade for each alternative and under both the constrained and unconstrained budget scenario.

Table 16. Estimated Amount of Forested Vegetation that would be Actively Managed by Alternative and Budget Scenario

Alternative and Budget Scenario	Acres of Forest Vegetation Management During First Decade	Percent of Total Acreage on the IPNF that would have Forest Vegetation Management During First Decade
A – without budget constraint	55,370	2.2
A – with budget constraint	48,670	1.9
B Modified – without budget constraint	141,900	5.7
B Modified – with budget constraint	94,670	3.8
C – without budget constraint	131,950	5.3
C – with budget constraint	110,320	4.4
D – without budget constraint	107,900	4.3
D – with budget constraint	79,120	3.2

Table 16 shows that without a budget constraint Alternative B Modified would actively manage slightly more acres than would Alternative C, and substantially more than either A or D. With a constrained budget, Alternative C would actively manage slightly more acres than would Alternative B Modified, and a substantial more acreage than either Alternatives A or D. Alternative A does the least amount of vegetation management. The model for Alternative A did not include prescribed burning as a vegetation management activity, since the model had no objective to move towards vegetation desired conditions.

Table 17 illustrates the change to forest composition (indicated by the distribution of dominance groups) by alternative over the next five decades. The table includes the change needed from current conditions in order to be within the range for desired conditions. Acres by alternative include changes for all forested acres; both those that had timber harvest or prescribed burning activities, and those that did not.

Table 17 indicates some of the dominance groups are moving towards desired conditions while others are not. Those moving towards desired conditions under both budget scenarios include ponderosa pine, lodgepole pine, grand fir/cedar/hemlock mix, and white pine. Generally, those dominance groups that are predicted to move towards the desired conditions do so to a much greater degree without a constrained budget than they do so under a constrained budget. Those dominance groups that are predicted to move away from desired conditions under both budget scenarios include subalpine fir mix, and to a much lesser degree, Douglas-fir and western larch.

Under a constrained budget, fewer acres are actively managed and less progress is made in moving towards desired conditions. Alternative D would trend slightly more of the dominance groups towards the desired conditions and to a greater degree than would Alternative B Modified under both budget scenarios. Alternatives A and C would not trend the dominance groups toward the desired conditions as much as would Alternative B Modified or Alternative D.

Table 17. Change in Acres by Dominance Group by Alternative over the next 50 Years

Dominance Group	Minimum Change needed to be within Desired Condition Range	Alt A [1]	Alt B Modified	Alt C	Alt D
Results with Unconstrained Budget					
Ponderosa Pine	+83,500	+23,214	+23,392	+21,931	+25,072
Douglas-fir	Within [2]	+47,147	+38,431	+40,302	+39,967
Lodgepole Pine	-126,500	-89,333	-82,517	-81,363	-90,746
Western Larch	+121,700	-4,635	-6,312	-5,758	-4,175
Grand Fir/Cedar/ Hemlock mix	-512,900	-174,568	-166,226	-157,244	-201,115
White Pine	+431,900	+181,930	+188,825	+175,919	+219,511
Subalpine Fir mix	-83,500	+48,153	+42,822	+43,312	+45,473
Results with Constrained Budget					
Ponderosa Pine	+83,500	+21,511	+19,778	+19,790	+20,557
Douglas-fir	Within [2]	+53,499	+48,858	+48,684	+48,579
Lodgepole Pine	-126,500	-89,276	-82,543	-82,125	-82,372
Western Larch	+121,700	-4,147	-904	-1,622	-1,907

Dominance Group	Minimum Change needed to be within Desired Condition Range	Alt A [1]	Alt B Modified	Alt C	Alt D
Results with Unconstrained Budget					
Grand Fir/Cedar/ Hemlock mix	-512,900	-25,989	-45,431	-44,829	-50,912
White Pine	+431,900	+28,911	+48,691	+48,185	+54,190
Subalpine Fir mix	-83,500	+47,547	+45,879	+46,129	+46,057

[1] Alternative A does not have an objective to manage for vegetation desired condition. Numbers reported are results only, and not a desired outcome from the model.

[2] Douglas-fir is currently within the desired condition range. To stay within the range, there should be no more than a 272,100 acre reduction or no more than a 38,100 acre increase in Douglas-fir.

As noted above, three dominance groups are either not moving towards vegetation desired or moved outside of the desired range over the 50-year simulation period. The subalpine mix and western larch are moving away from desired conditions while Douglas-fir is currently in the desired range, but is predicted to move outside of the desired range to a small degree. In addition, even the dominance groups that are trending toward the desired conditions are generally not moving towards those conditions very substantially, especially given the long 50-year simulation period and the likely scenario that budgets will indeed be constrained. There are two key reasons for these general modeling results. First, a large portion of the Forest is not being actively managed in the model simulations because only 36-39 percent (depending upon alternative) of the forested acreage has been determined to be suitable for timber production, and even those acres have various resource constraints placed upon them that limit the frequency and intensity of the treatments (see the management constraint section of appendix B for more details). Thus, even under the assumption of an unconstrained budget very little of the forested area gets actively managed and therefore there is very limited opportunity to use management tools (i.e., timber harvest or prescribed fire) to trend the vegetation towards desired conditions. For example, as shown in table 16, during the first decade only about two to six percent (depending upon alternative and budget scenario) of the forested area is actively managed.

The second reason that the models are not predicting more progress towards achieving the desired condition for the dominance groups has to with the lack of enough fire disturbance on the landscape that would beneficially affect the dominance groups. Even though the SIMPPLLE model predicts a substantial amount of wildfire will occur in the future (e.g., approximately 40,000 acres/decade of stand replacing fire), it is not enough to have a substantial beneficial impact at the scale of the entire IPNF in regards to the dominance groups.

In the absence of fire or active management, most of the changes in species composition over time would be in the opposite direction from what is desired. In general, the desired trend is to obtain more forests dominated by early seral, shade-intolerant species (e.g., western larch, ponderosa pine, white pine, and white bark pine), yet without either active management (harvest and/or prescribe burning) or wildfires, the current trend of the forest becoming more and more dominated by shade-tolerant, mid-to late-seral tree species (e.g., Douglas-fir, grand fir, western hemlock, cedar, and subalpine fir) will continue. If more wildfire were to actually occur than was simulated in the models, then it is likely that it would improve the trajectory more towards the desired dominance groups.

Broadleaved tree species (e.g., red alder, water birch, paper birch, quaking aspen, and black cottonwood) dominate relatively few forest stands on the IPNF (approximately 0.3 percent). These species were not included in the modeling and thus no quantitative estimates are provided as to how they may increase or decrease in abundance under the different alternatives. However, some general qualitative trends can be predicted based on the knowledge of the silvics[1] of these trees along with an understanding of how the predicted amounts of active management and wildfires may impact the species. All of these broadleaved species can be characterized as being intolerant or very intolerant of shade, and of being early seral or pioneer species (Burns and Honkala 1990). With one exception (black cottonwood) these species live relatively short lives. All of these species are dependent upon disturbances to regenerate themselves. It could be wildfire, prescribed burning, timber harvesting, riparian flooding, or another type of disturbance that provides growing space and suitable conditions for the establishment and growth of these trees. Historically, wildfire was probably the most important disturbance agent in perpetuating these species on upland sites, while a combination of wildfires, blow down, and flooding were likely the most important in the riparian areas. Without active management or substantial amounts of fire, it is expected that these broadleaved species will continue to decrease in abundance. Without a budget constraint, Alternative B Modified would likely have the most beneficial effect on increasing the broadleaved tree species with Alternative C ranked second. Under a budget constraint, Alternative C would have the largest impact towards the desired condition with Alternative B Modified ranked second. Alternatives A and D would have much less of a positive impact under both budget scenarios.

As described in the “Affected Environment” section, whitebark pine occurs over a small percentage of the Forest (approximately 1.2 percent) and this species has been declining in abundance due to bark beetles, blister rust, and fire exclusion. Although an attempt was made to model how the habitat (i.e., amount of suitable habitat for regeneration of whitebark pine) for whitebark pine might change over time under the alternatives and budget scenarios, results from the modeling were somewhat inconclusive (Ecosystem Research Group (2012). However, it seems that the amount of area that is suitable for the regeneration of whitebark pine is predicted to increase in the future as more wildfires burn in the higher elevations where potential habitat occurs. Aside from the modeling effort, all of the Action Alternatives contain direction that would encourage restoration activities to occur for this species. Obviously, more active management would occur without a budget constraint than it would if budgets were constrained. Since Alternative A does not contain management direction that encourages whitebark pine restoration activities, that alternative would have the least potential for activities to occur that would benefit that species.

Table 18 illustrates the change to forest structure (indicated by the distribution of size classes) by alternative over the next five decades as well as the change needed from current conditions in order to be within the range for desired conditions. Acres by alternative include changes for all acres, including lands that are actively managed and those that are not.

[1] Silvics is known as the study of the life history and general characteristics of forest trees and stands, with particular reference to environmental factors.

Table 18. Change in Acres by Size Class by Alternative over the next 50 Years

Size Class	Minimum Change needed to be within Desired Condition Range	Alt A [1]	Alt B Modified	Alt C	Alt D
Results with Unconstrained Budget					
Seedling/sapling	+143,100	-115,559	-126,166	-126,731	-123,118
Small	-167,000	+561,656	+515,446	+508,838	+506,363
Medium	-190,900	-403,354	-408,103	-398,289	-385,327
Large/Very large	Within [2]	-10,836	+54,243	+51,566	+34,730
Results with Constrained Budget					
Seedling/sapling	+143,100	-114,415	-122,954	-128,564	-121,102
Small	-167,000	+450,190	+441,395	+445,284	+428,940
Medium	-190,900	-386,954	-386,261	-391,681	-379,018
Large/Very large	Within [2]	+83,235	+102,149	+109,175	+105,372

[1] Alternative A does not have an objective to manage for vegetation desired condition. Numbers reported are results only, and not a desired outcome from the model.

[2] The large/very large size class is within the desired range. If more than 71,600 acres are lost or more than 664,100 acres added, this size class will no longer be within the desired range.

Table 18 indicates the seedling/sapling size class is moving in the wrong direction for desired condition, with a decrease in acres under all alternatives and for both budget scenarios. This is because of the relatively small amount of active management that is predicted to occur that would create this size class, as well as the lack of enough wildfire to have a meaningful effect at the scale of the entire Forest. Although the model simulations predict a substantial increase in the amount of wildfire in the coming decades compared to the recent past, there is still not enough acres burning, nor active management occurring that creates young, early-seral stands in the seedling/sapling size class.

With the unconstrained budget scenario, Alternative B Modified is slightly better in trending the vegetation towards the desired condition for size class as compared to the other alternatives. Under that unconstrained budget scenario, Alternative B Modified increases the amount of the large/very large size class the most as well as decreasing the amount of the medium size class- both of which are desired. In comparison, with the constrained budget scenario, Alternatives C and D do a slightly better job at trending the vegetation towards the desired size class distribution than do the other alternatives.

As noted in the affected environment section, the SIMPPLLE and Spectrum model simulations were used to predict how much of the forested vegetation may be similar in structure to old growth stands in the future. The results of the simulations are presented in table 19. The results show that for all alternatives and budget scenarios the amount of acres in the very large size class is predicted to increase substantially in the next 50 years. As noted earlier, the very large size class in the model simulations represents stands that are dominated by trees 20” in diameter or greater. Therefore, those estimates can be used to provide a rough estimate of how many acres may have similar characteristics to old growth stands in the future given all the predictions and assumptions built into the model simulations regarding wildfire, insects and diseases, future climate change (i.e., the modeling assumed a warmer/drier scenario from decade 3 to 5), and the amount of active management that is anticipated to occur for each alternative.

Despite the relatively large amount of the forest that is predicted to have stand replacing type wildfires during the next 50 years (approximately 200,000 acres total or 40,000/decade) and the insect and disease impacts, the model simulations still predict substantial increases in the amount of the forest in the very large size class in the future. As illustrated in table 19, Alternative B Modified is predicted to increase the amount of forest in the very large size class more than the other alternatives, and it does so under both the constrained and unconstrained budget scenarios.

Table 19. Change in Acres of Very Large Size Class over the next 50 years, by Alternative and Budget Scenario

Budget Scenario	Alt. A	Alt. B Mod.	Alt. C	Alt. D
Unconstrained	+ 184,648	+ 212,658	+ 206,467	+ 139,029
Constrained	+ 239,365	+ 246,827	+ 243,194	+ 243,450

As previously noted, if more stand-replacing wildfire occurs than was modeled, there may be a more desirable overall improvement in the movement of size classes towards desired conditions. With a small amount of forested vegetation actively managed with either regeneration harvest or simulated wildfires, only a small portion of the Forest is converted to the seedling/sapling size class. This in turn affects the amount of acres in small size classes, resulting in levels below desired condition while the large and very large size classes see great increases.

In addition to using size classes to describe how forest structure may change over time as a result of implementing the various alternatives, the snag component of forest structure was also analyzed using the Spectrum model. A forest growth simulation model called, forest vegetation simulator, was used to predict tree growth, mortality and yield attributes for the Spectrum model (see appendix B). Snags were one of the many items estimated by the forest vegetation simulator and incorporated into the Spectrum model. The amount of snags by density class was reported by the Spectrum model. Amounts of snags were a result of management (or no management) actions. There were no constraints or objectives to manage for certain levels of snags in the model.

The “Affected Environment” section provides detailed information about the existing and desired snag quantities and sizes. Table 20 contains information on predicted changes during the next five decades to snag densities and sizes as a result of implementing the various alternatives. All alternatives show an increase in the percentage of acres that have the highest number of snags per acre (both the 10-20 inch diameter snags as well as the 20 inch plus diameter snags). All action alternatives and budget scenarios would meet or exceed the standards and guidelines for snags.

Table 20. Percent of the Total Forested Acres that occur in each Snag Density and Size Class at Decade 1 and 5, and the Percent Change during that Period for each Alternative

Snag Size Class	Snag Density Class- # snags/ acre	Alternative A			Alternative B Modified			Alternative C			Alternative D		
		Percent of Total Forested Acres		Percent Change	Percent of Total Forested Acres		Percent Change	Percent of Total Forested Acres		Percent Change	Percent of Total Forested Acres		Percent Change
		Decade 1	Decade 5		Decade 1	Decade 5		Decade 1	Decade 5		Decade 1	Decade 5	
Unconstrained Budget													
Snags 10-20" DBH	0-5.9	15	9	-6	15	8	-7	15	8	-7	15	9	-6
	6-9.9	6	11	5	6	12	6	6	11	5	6	11	5
	10+	79	80	1	79	80	1	79	81	2	79	80	1
Snags 20"+ DBH	0-0.9	18	13	-5	18	14	-4	18	15	-3	18	14	-4
	1-3.9	61	35	-26	60	33	-27	61	33	-28	61	35	-26
	4+	21	52	31	22	52	30	22	53	31	21	51	30
Constrained Budget													
Snags 10-20" DBH	0-5.9	15	5	-10	15	5	-10	15	6	-9	15	5	-10
	6-9.9	6	12	6	6	9	3	6	8	2	6	10	4
	10+	79	83	4	79	86	7	79	86	7	79	85	6
Snags 20"+ DBH	0-0.9	18	13	-5	18	11	-7	18	13	-5	18	14	-4
	1-3.9	61	30	-31	61	28	-33	61	31	-30	61	30	-31
	4+	21	56	35	22	61	39	22	55	33	22	56	34

Landscape Pattern

Management Direction

Alternative A – No-action Alternative

The existing Forest Plan contains minimal direction on the desired landscape pattern for forest vegetation. One forestwide objective (item t, p II-11) discusses “breaking up” large areas of forest that have a single age class through the use of timber harvest in order to reduce bark beetle outbreaks, and two forestwide standards (items 7 and 8, p II-32) talk about forest opening sizes and generally keeping them 40 acres or less in size. Individual MA descriptions do not provide any additional direction on pattern.

In addition to the direction described above that is only applicable to Alternative A, the following Plan direction is common to all alternatives and could potentially affect the landscape pattern of forest conditions. The “retained existing Forest Plan direction” in the revised Forest Plan (see chapter 1 of this EIS and appendix B in the revised Forest Plan for more information on this direction) that could potentially affect landscape pattern includes the INFISH, NRLMD, and the Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones. When describing the effects that the alternatives would have on landscape patterns, the direction mentioned above was considered.

Action Alternatives B Modified, C, and D

All of these action alternatives contain a forestwide goal (Goal-01) and a desired condition (FW-DC-VEG-05) on the desired pattern relative to the existing pattern for forest structure and composition. In addition, the desired pattern for forest structure and composition is provided for each of the three biophysical settings (FW-DC-VEG-11). The desired pattern for hazardous fuels is provided in FW-DC-FIRE-02 and the desired pattern for snags is described in FW-DC-VEG-07. At the smaller scale (GAs), additional direction is provided on certain aspects of landscape pattern (i.e., GA-DC-VEG-CDA-01, GA-DC-VEG-LK-01, and GA-DC-VEG-SJ-01). There is also Forest Plan direction related to fire that affects landscape pattern.

General Effects

As discussed previously, past wildfire suppression efforts and timber harvest patterns have largely been responsible for creating a pattern of forest conditions (e.g., size class, species composition, stand structure, and density) different from historical patterns. The current pattern is more susceptible to some insects, diseases, and wildfire disturbances. Forest patches dominated by the smallest-sized trees, as well as patches dominated by the largest trees, have decreased substantially in size relative to historical conditions. On the other hand, patches of forest dominated by trees of moderate size have become much larger. Across all size classes and fuel conditions the continuity of stand structures has increased and become more homogenized at the landscape scale.

Alternative A does not contain direction to provide for improved landscape pattern. Under the direction of the current Forest Plan it is assumed that regeneration harvest treatments will continue to be relatively small in size, that commercial thinning treatments would only occur over small-to moderate-size areas, and that almost all wildfires would be suppressed, or an attempt made at suppression. As previously discussed, all of the alternatives would be expected to have a substantial number of acres burn from wildfires despite suppression efforts. Therefore, wildfires are likely to have beneficial effects in the landscape pattern for all the alternatives.

Alternative A would likely have the least beneficial effect on the pattern of size classes on the landscape (relative to the desired conditions). The patch size of the seed/sap size class would not increase and the patch size of the small/medium size classes would not decrease. Although there are exceptions, a relatively high percentage of the large patches of forest that are dominated by stands in the small/medium size classes are located in MAs that either exclude the use of commercial timber harvesting or de-emphasize it. Therefore, without the use of prescribed burning at a large scale, or the use of natural, unplanned ignitions in those areas to break up the continuity of fuels and stand structures, these large patches of forests dominated by medium size trees will not be reduced as desired (unless burned via a wildfire). As discussed in more detail in the section about resistance and resiliency to disturbances, the ramifications of the predicted trends for landscape pattern include a greater likelihood that some disturbances such as wildfires and bark beetles may become larger and/or more intense in the future due to the connectivity of some of these forest conditions.

Under the action alternatives, management direction for landscape pattern is anticipated to lead to improvements in the pattern of forest vegetation on the landscape. The amount of improvement in landscape pattern is directly related to the amount of active or passive vegetation management that will occur. Without a budget constraint Alternative B Modified would actively manage slightly more acres than would Alternative C, and substantially more than either A or D. With a constrained budget, Alternative C would actively manage slightly more acres than would Alternative B Modified, and a substantial more acreage than either Alternatives A or D. Alternative A does the least amount of vegetation management.

Resistance and Resiliency to Disturbances and Stress Agents

Management Direction

Alternative A – No-action Alternative

The 1987 Forest Plan does not contain any explicit direction regarding the management of the Forest for a goal or objective of maintaining or improving the resistance and/or the resiliency of the forest vegetation to disturbances and other forest stressors. However, through several Plan components, the Plan does portray the intent to protect the timber resource from insect, disease, and/or wildfire-caused damage. The 1987 Plan contains one forestwide goal (#24, p II-2), two forestwide objectives (items l, p II-8 and t, II-10), and several forestwide standards (item #4, p II-32, item #1, p II-38, and item #2, p II-39) that express expectations of keeping the damage to the Forest from insects/disease and or wildfire to an acceptable amount. In addition, there is one forestwide standard (#2e, p II-38) that indicates that fire suppression response for designated old growth stands shall be intended to prevent the loss of the old growth.

For Alternative A (as well as the other alternatives) the “retained existing Forest Plan direction” that has been previously discussed could affect this issue, and therefore, it was considered in the following analysis. As was done with other topics, some of the effects of this direction could be predicted with modeling, while other effects were addressed qualitatively.

Action Alternatives B Modified, C, and D

These Action Alternatives all contain Forest Plan direction regarding the need and desire to increase the resistance and resiliency of forest conditions to disturbances and stressors. For example, forestwide vegetation and fire goals (Goal-01) and desired conditions (FW-DC-VEG-01, 03, 04, 05, 06, 11, FW-DC-FIRE-02, 03) articulate the need and vision for managing the Forests towards that overall goal. Forestwide vegetation and fire objectives (FW-OBJ-VEG-01, FW-OBJ-FIRE-01) and guidelines (FW-GDL-VEG-01, 02) contain additional direction and guidance regarding resistance and resiliency.

As discussed above in the "Management Direction" section for Alternative A, some of the "retained existing Forest Plan direction" was considered for these alternatives as well.

General Effects

Forest conditions on the IPNF are currently quite different from the range of historical conditions with regard to composition, structure, landscape pattern, and ecological processes. Consequently, the Forests are predisposed to new levels and types of stress agents and disturbances. Combined with the possible effects of climate change (discussed in more detail in the "Cumulative Effects" section), the current conditions are not desirable.

The resistance and resiliency of a forest to stress agents and disturbances is largely a function of the composition, structure (including density) and landscape pattern of forest conditions, and how those elements interact together. Both quantitative and qualitative information is utilized to assess how susceptible the forest may be to the various key stress agents.

The forest vegetation simulator was used to model bark beetles, defoliating insects, and wildfire risk. These attributes were included in the growth and yield tables in the Spectrum model and reported for each run (see appendix B and Vandendriesche (2005) for more information on the forest vegetation simulator and Spectrum modeling). Other important disturbances or stressors that could potentially affect the alternatives, such as root diseases, white pine blister rust, and weather (e.g., drought, wind, and snow/ice) were addressed qualitatively.

Table 21 displays the Spectrum results for fire, bark beetle, and budworm hazard ratings for each alternative. The table shows current percent of the Forest by hazard rating and percent change in ratings from decade 1 to decade 5.

Table 21. Percent of Total Forested Acres of Fire, Bark Beetle, and Defoliator Hazard Rating at Decade 1, and the Change between Decade 1 and Decade 5, by Alternative

Hazard Type	Hazard Rating	Decade 1- % of Total Acres	Percent Increase or Decrease of Total Acres from Decade 1 to Decade 5			
			Alt. A	Alt. B Modified	Alt. C	Alt. D
Results with Unconstrained Budget						
Fire	Low/Moderate	3%	15%	21%	20%	19%
	High/Very High/Extreme	97%	-15%	-21%	-21%	-19%
Bark Beetles	Low	2%	7%	7%	7%	7%
	Moderate	93%	-10%	-9%	-9%	-11%
	High	5%	4%	2%	2%	4%
Defoliators	Low	6%	4%	5%	4%	4%
	Moderate	32%	-10%	-6%	-6%	-6%
	High	62%	6%	1%	2%	2%
Results with Constrained Budget						
Fire	Low/Moderate	3%	11%	13%	13%	13%
	High/Very	97%	-11%	-13%	-13%	-13%

Hazard Type	Hazard Rating	Decade 1- % of Total Acres	Percent Increase or Decrease of Total Acres from Decade 1 to Decade 5			
			Alt. A	Alt. B Modified	Alt. C	Alt. D
	High/Extreme					
Bark Beetles	Low	2%	3%	4%	4%	4%
	Moderate	93%	-6%	-6%	-6%	-6%
	High	5%	3%	2%	2%	2%
Defoliators	Low	5%	-1%	1%	2%	1%
	Moderate	32%	-11%	-9%	-10%	-8%
	High	63%	12%	8%	8%	7%

Fire hazard – As illustrated in table 21, a large percentage of the total forested acres on the IPNF are rated as having a high, very high, or extreme fire hazard. This is decreased somewhat over the first five decades. Timber harvest and prescribed burning reduces the fire hazard in stands. However, even though the results in table 21 show a reduction in the percentage of the Forest in the combined high, very high and extreme hazard classes, the amount of Forest in the extreme class goes up substantially over time. This is a result of the acres in the high and very high categories having a tendency to move into the extreme category. Alternatives with the most passive and active management will have the greatest impact on reducing the trend of increasing the amount of the Forest in the extreme category. Alternatives B Modified and C reduce fire hazard the most and Alternative A the least. This is because Alternatives B Modified and C have the most acres of active and passive management while Alternative A has the least amount of active management and does not include prescribed burning. Relative to the constrained budget scenario, the unconstrained budget scenario would result in a greater reduction in the higher hazard levels for all alternatives.

After the draft Forest Plan and DEIS was released to the public, some additional modeling was conducted using SIMPPLLE to determine how much and what kind of wildfire might occur on the IPNF in the next 5 decades (Ecosystem Research Group 2012, Chew 2012). The complete modeling and analysis was done for a no-action alternative (no active management at all), and for Alternative B Modified with and without budget constraints. The results and methodology are explained at length in the reports by the Ecosystem Research Group (2012) and Chew (2012). The summary is that wildfires will increase substantially across the Forest in the next five decades, despite the assumption of continued suppression efforts. However, compared to an alternative of not conducting any active treatments (timber harvesting or prescribe burning), Alternative B Modified was found to result in a decrease in acres burned and the severity of the fires with the most noticeable reduction being to the stand replacing fires, versus the mixed and low severity types (Ecosystem Research Group 2012) . The unconstrained budget scenario had a larger effect of decreasing the wildfire acres than did the constrained budget.

Bark Beetle Hazard – The bark beetle hazard rating is a hazard rating of tree mortality from the spruce beetle, mountain pine beetle, and the Douglas-fir beetle (Vandendriesche 2005). The low, moderate, and high hazard rating system was based on risk factors such as tree diameter, stand density (basal area), and the percentage of the stand that was a host species. As shown in table 21, most of the forested acres (93 percent) have a hazard rating of moderate at the beginning of decade one. At the unconstrained budget level, all alternatives show a slight increase in both the low and high rating over the first five decades. The amount of change is reflective of the amount of active and passive management. Alternatives B Modified and C provide for the most management and thus the least increase in high hazard rating. Alternatives A and D provide the least active and passive management, therefore, have a slightly higher increase in the high hazard rating.

Defoliator Hazard – The defoliator hazard rating is a hazard rating of tree mortality from the western spruce budworm and Douglas-fir tussock moth (Vandendriesche 2005). The primary host trees for these insects are Douglas-fir, grand fir, subalpine fir, and Englemann spruce. As illustrated in table 21, most of the forested acres have a hazard rating of moderate (32 percent) or high (62 percent) at the beginning of decade 1, while very few acres have a rating of low (6 percent). Under all alternatives, the proportion of acres with a high or low rating increases by the 5th decade while the amount in moderate rating decreases. The increase in the high rating is largely a function of an increase in tree species that serve as primary hosts to these defoliating insects (the more shade-tolerant grand fir, subalpine fir, Englemann spruce, and Douglas-fir) as well as the stand structures becoming more conducive to these insects (i.e., denser with more canopy layers). Both passive and active management activities reduce the amount of high rating. Alternative B Modified has the least and Alternative A the most increase in high defoliator hazard ratings.

After the draft Forest Plan and DEIS were released to the public, some additional modeling was conducted for bark beetles and a defoliator insect using the SIMPPLLE model (Ecosystem Research Group 2012, Chew 2012). The modeling was done for the mountain pine beetle, Douglas-fir beetle, and for the western spruce budworm. The results and methodology are explained at length in the reports by the Ecosystem Research Group (2012) and Chew (2012). The complete modeling and analysis was done for a no-action alternative (no active management at all), and for Alternative B Modified with and without budget constraints. To summarize, a substantial amount of acreage of the IPNF is expected to be affected by the mountain pine beetle (primarily killing lodgepole pine) in the next few decades. From decade 2 through decade 5, Alternative B Modified has fewer acres affected by the mountain pine beetle than would an alternative that did not actively treat any vegetation. Regarding impacts from either the western spruce budworm or the Douglas-fir beetle, the SIMPPLLE modeling did not discern much difference in acres impacted between the no-action and Alternative B Modified (Ecosystem Research Group 2012).

Root Diseases – Effects of the alternatives on root disease was qualitatively assessed based on the anticipated changes to forest composition. Armillaria root disease and annosus and laminated root rots are three of the more important root pathogens on the IPNF. Grand fir, Douglas-fir, subalpine fir, and the hemlocks (western and mountain) are generally the most susceptible tree species, while the more tolerant or resistant are generally ponderosa pine, western larch, western white pine, western redcedar, and lodgepole pine.

The change to tree composition over the next 50 years is described above (see table 17 and subsequent discussion). The increases predicted in ponderosa pine, larch, and white pine with the associated decrease in Douglas-fir will improve conditions and limit root disease. However, the predicted increases in the grand fir/cedar/hemlock mix and the subalpine fir mix will increase susceptibility to root disease. Those alternatives that do the best job moving vegetation towards desired condition (Alternative B Modified, C, and D) will also reduce the amount of acres susceptible to root disease.

After the draft Forest Plan and DEIS were released to the public, some additional modeling was conducted for root disease using the SIMPPLLE model (Ecosystem Research Group 2012, Chew 2012). The results and methodology are explained at length in the reports by the Ecosystem

Research Group (2012) and Chew (2012). The analysis concluded that the acres affected by root disease on the IPNF will increase in the future, but that in comparison to an alternative of doing no active management, Alternative B Modified would result in fewer acres being impacted (Ecosystem Research Group 2012).

White Pine Blister Rust – Management activities to reduce the effects of white pine blister rust include; planting of rust resistant western white pine and vegetation management activities in whitebark pine stands (thinning, prescribed burning). As described above for tree composition (see table 17 and subsequent discussion), Alternative D provides the greatest increase in western white pine and Alternative B Modified ranks second. As previously noted, all of the action alternatives would improve conditions for white bark pine, especially if there were no budget constraints. Alternative A has the least direction to manage to improve these pine species.

Weather, Moisture Stress, and Forest Density – Forest composition, structure, and landscape pattern can influence the susceptibility of forest stands to weather related disturbances or stressors. Therefore, to the degree that the alternatives influence those forest conditions, they also influence the potential stress caused by weather related disturbances.

Droughts are a weather event that often occurs on a decadal basis and serves to stress trees, especially those that are drought-intolerant. This in turn can predispose the trees to bark beetle attacks and/or root diseases (Hagle et al. 2000, Bentz et al. 2010). Under Alternative A, the drought-intolerant species of grand fir, hemlock, cedar, and subalpine fir are expected to increase in abundance. Therefore, in the future when droughts do occur, the Forests are likely to exhibit increased signs and symptoms of this stress. Alternatives B Modified and C provide the most active and passive management to reduce the amount of these species and replace them with more drought-tolerant species, such as ponderosa pine, larch, and white pine. As discussed in the “Affected Environment” section, the density of a forest affects the moisture stress that trees are under and influences their susceptibility to mortality from a number of insect and diseases. Through both active and passive management, Alternatives B Modified and C would reduce the forest density more towards the desired condition than would the other alternatives.

Snow and/or ice accumulations and wind are other weather events to which certain species and forest structures are susceptible. A substantial amount of blowdown and/or stem breakage can precipitate bark beetle outbreaks, increase surface fuel loadings, and elevate fire hazards. In general, the most susceptible species and stand structures are predicted to increase under Alternative A. Alternatives B Modified and C provide the most active and passive management and increase the species that are less susceptible to windthrow.

Carbon Sequestration

Management Direction

All Alternatives

The effect of management activities on the ability of forest vegetation to sequester carbon was not an issue or analysis item that was included in the 1987 Forest Plan; therefore, Alternative A does not include any management direction on this item. Alternatives B Modified, C, and D, indirectly give carbon sequestration direction by addressing disturbance processes that affect sequestration. Management activities can affect the ability of forests to sequester carbon when they address relevant disturbance processes. The Forest Plan components that are part of Alternatives B Modified, C, and D that were presented above in the “Management Direction” section of the "Resistance and Resiliency to Disturbances and Stress Agents" topic are relevant to carbon sequestration.

General Effects

Carbon sequestration is a measurement of how much carbon is stored on the Forest. Carbon sequestration was modeled in Spectrum in three different pools: forest inventory or growing stock volume; harvested forest products; and dead forest inventory volume resulting from stand-replacing wildfires. For the inventory pool, both non-soil carbon and soil organic carbon were taken into account. The harvested forest product is the amount of carbon stored in wood products harvested and removed from the forest. This amount diminishes over time. The dead forest inventory is the amount of carbon stored in dead timber following a stand-replacing wildfire. This amount also decreases over time. See appendix B for more information. Table 22 summarizes the total metric tons of carbon sequestered 50 years from now (in the 5th decade of the model).

Table 22. Thousand Metric Tons of Carbon Sequestered in the 5th Decade by Alternative

	Alt. A	Alt. B Modified	Alt. C	Alt. D
Results with Unconstrained Budget				
Carbon sequestered in inventory of forested acres	225,448	224,560	224,988	223,985
Carbon sequestered in wood products	2,316	2,327	2,224	2,426
Carbon sequestered in acres burned by wildfire	1,764	1,706	1,703	1,694
Total Carbon	**229,528**	**228,593**	**228,915**	**228,105**
Results with Current Budget Level				
Carbon sequestered in inventory of forested acres	233,231	232,087	232,113	231,879
Carbon sequestered in wood products	947	887	884	902
Carbon sequestered in acres burned by wildfire	1,767	1,730	1,728	1,736
Total Carbon	**235,945**	**234,704**	**234,725**	**234,517**

At the unconstrained budget level, Alternatives A and C has the greatest amount of carbon sequestration in decade 5. These alternatives contain the highest amount of carbon from standing trees because they have fewer acres of regeneration harvest than Alternatives B Modified and D. Carbon sequestration is higher under the constrained budget level because fewer acres are regeneration harvested. It should be noted the amount of carbon sequestered is very similar for all alternatives. This is because of the large inventory (standing trees) on the Forest sequestering carbon. This inventory doesn't change much by alternative.

Currently, the IPNF stores approximately 177 million metric tons. For all alternatives, the IPNF acts as a carbon sink, sequestering more carbon over time than is lost through natural and human disturbance. Alternative A, at the constrained budget level, has the largest addition in carbon sequestration storing an additional 23.6 million metric tons over the next 50 years. Alternative D, at the unconstrained budget level, has the smallest addition in carbon sequestration storing an additional 22.8 million metric tons over the next 50 years.

The amount of carbon sequestered may be limited by the vegetation composition. The root disease associated with large amounts of the grand fir/cedar/hemlock species group decreases the growth potential for these stands, limiting the ability to sequester carbon. If these stands are converted to white pine and western larch, which is in line with the vegetation desired condition, there would be increased carbon sequestration potential on these acres.

Consequences to Forest Vegetation from Forest Plan Components Associated with other Resource Programs or Revision Topics

The general effects that the alternatives would have on forest vegetation have been described above. That discussion focused on the consequences that would result from implementing the Forest Plan components related to forest vegetation. The emphasis in the following discussion is on how other (i.e., those not directly related to forest vegetation) Forest Plan components may influence forest vegetation and the attainment of the desired conditions.

Effects from Access and Recreation Management

Forest Plan direction for scenery management in the action alternatives (i.e., FW-GDL-AR-01) would restrict the type of vegetation treatments that could occur in some areas across the Forest. For example, some regeneration methods or other silvicultural practices (i.e., the use of prescribed fire or natural, unplanned ignitions) may not be compatible with the scenic integrity objectives of High or Very High that are established along scenic travel routes; therefore, those components could have a small effect on the ability to reach the desired conditions for forest vegetation. The consequences that would result from the no-action alternative as a result of Plan components in the 1987 Forest Plan (e.g., forestwide standard #1 under the Visual heading on page II-25 of the Plan) are fairly similar to the action alternatives.

Forest Plan direction for management of transportation systems in the action alternatives (i.e., FW-DC-AR-07, FW-OBJ-AR-03) may limit vegetation management opportunities. Placing roads into intermittent storage or decommissioning roads could increase future costs associated with vegetation treatments, and therefore, could have an impact on the economic feasibility of these treatments. However, because only a relatively small amount of road storage/decommissioning activities are anticipated across the Forest, the effects are minimal.

Public safety issues in developed and undeveloped recreation sites limit the ability to maintain the desired snag levels indicated under the action alternatives (i.e., FW-DC-VEG-07 and FW-GDL-VEG-04). However, because these recreation areas are generally small in size, the effect of not having snags on the ability to meet the forestwide desired conditions is negligible.

Winter recreation trails (primarily the groomed snowmobile routes) and associated Forest Plan direction (i.e., FW-OBJ-AR-04) may affect the ability to implement some winter season vegetation treatments because of a conflicting resource issue such as grizzly bear security or soil disturbance concerns. However, these effects are likely very small and do not vary by alternative.

The use of over-snow vehicles off of groomed or ungroomed routes could cause a small, insignificant amount of damage to trees or other vegetation that protrudes above the snow. In rare instances, the tops of small trees that extend above the snowpack could be damaged from over-snow vehicles. However, in most cases this effect would only be noticeable in very small areas where the public might concentrate their use of these vehicles. Seldom would the impact likely result in any mortality of the trees or shrubs. Rather, this impact could cause very minor forking of the damaged trees.

Effects from Wildlife Management

Measures to protect certain wildlife species limit treatments to move vegetation towards desired conditions. Management direction for grizzly bear, lynx, caribou, big game winter range, and elk security result in limitations on the timing, type, and amount of vegetation treatments.

Forest Plan direction limits management in grizzly bear management units (BMUs), especially within core areas. Timing, frequency, and size of treatments must be considered, thus minimizing the amount of acres that can be actively managed. Grizzly Bear Core Areas are not suitable for timber production, and timber harvest is limited in these areas. This results in fewer acres that can be treated to move vegetation towards desired condition. The effect is similar for all alternatives, reducing acres treated to improve vegetation.

With regard to whitebark pine, which is on the Region One sensitive species list and is a Candidate species for federal listing under the ESA, a significant percentage of whitebark pine sites on the IPNF are located in BMUs. In addition, most of the whitebark pine habitat on the IPNF occurs in roadless areas (inventoried roadless areas, wilderness or wilderness study areas). In these areas, restoration activities for whitebark pine are logistically and economically challenging and often necessitate the use of helicopters and other motorized equipment (i.e., using helicopters to ignite prescribed burns or transport workers to plant trees, using chainsaws to thin-out other trees species from around existing whitebark pine trees). Because motorized equipment can disturb the bears it could be time consuming and expensive to conduct the required environmental analysis and consultation with the USFWS in order to conduct a whitebark pine restoration project. This could decrease the number and scope of restoration projects that might otherwise occur on the Forest.

For lynx, all of the alternatives contain the NRLMD. One substantial impact this direction has on the forest vegetation is to limit the ability to pre-commercial thin (or otherwise similarly treat) young forest stands. The effect is that in mixed stands, shade-intolerant tree species such as western larch may be outcompeted by shade-tolerant species in the absence of natural or man-caused disturbances. Since the shade intolerant tree species are very desirable due to their relative resistance to insects, disease, fire, and drought, and because of its long-lived nature, this effect is substantial. For whitebark pine, most of the suitable habitat for that tree species on the IPNF also occurs in lynx habitat. Depending upon the circumstance, some of the management direction for lynx in the NRLMD may impact the ability to conduct restoration activities for whitebark pine.

The 1987 Forest Plan contains a standard for caribou habitat (page III-36) to suppress wildfires to prevent the loss of trees. On the northern portion of the IPNF, the 1987 Plan estimated that the habitat was over 117,000 acres in size. Because of the location of the habitat, generally on ridge and mountain-tops in remote areas, the area would otherwise form one of the best places to use natural, unplanned ignitions for improving other resource conditions. For example, fire would help trend the subalpine fir- Engelmann spruce dominated stands towards a more desirable composition and structure, and would likely help in the restoration of whitebark pine habitat. As opposed to Alternative A, which would continue the practice of trying to suppress all unplanned ignitions in caribou habitat, the action alternatives would allow for the consideration of the use of natural, unplanned ignitions. Therefore, from this standpoint, the Action Alternatives would have less impact on the ability to use natural, unplanned ignitions. However, it is still anticipated that many of the natural, unplanned ignitions in caribou habitat would still be suppressed due to concerns over the loss of key seasonal habitats from a fire. Because whitebark pine restoration activities often require the use of fire, the presence of the caribou habitat and management direction would likely also have a negative effects on that tree species.

As noted above, management requirements for caribou, lynx, and grizzly bear would have some likely impacts on potential restoration efforts of whitebark pine for all alternatives. Even if a potential project could be accomplished given the overlapping wildlife management restrictions for those federally listed species, the high cost and time required for doing the environmental analysis may have the effect of discouraging such projects from taking place, and if they did occur, the expense of conducting them would likely take some resources away from some other restoration project. While it would be very difficult or impossible to quantify this impact, the effect of having habitat for several threatened and endangered wildlife species overlapping most the whitebark pine sites would likely result in fewer and smaller restoration projects occurring for the whitebark pine on the IPNF.

Another effect on vegetation from revised Forest Plan direction related to wildlife is the desire to maintain or provide old growth or stands with old forest structures for terrestrial species associated with these habitats. To accomplish this, there may be a need to prevent these stands from being lost to stand-replacing wildfires. These stands currently tend to be distributed over most of the landscapes on the IPNF, and it may be necessary to consider the level of risk to stands managed for old growth. By minimizing the loss of these types of stands, one effect to vegetation may be that wildfires are suppressed more often, which could reduce the ability to achieve other aspects of the vegetation desired condition (such as increasing early-successional forests and shade-intolerant tree species). The 1987 Forest Plan contains a forestwide standard (item 2e under heading Fire Management, page II-38) that wildfires would be suppressed if there was a risk of losing designated old growth (with the possible exception of wilderness areas). None of the action alternatives contain this direction. Therefore, wildfires would likely be suppressed more often under Alternative A than they would under the other alternatives.

Management for big game winter range limits the amount of openings in these areas. When conducting timber harvest in winter range, the timing, silvicultural prescription, and size of openings must be consistent with objectives for winter range. In addition, the action alternatives contain direction for elk security. That direction not only affects motorized road access during hunting season, but it also could restrict the amount of the elk management units that are in an open condition in the Coeur d'Alene and St. Joe Geographic Areas. This elk security and big game winter range direction causes some limitation on the amount of acres that may be treated with timber harvest reducing the ability to move towards vegetation desired condition. These effects are similar for all alternatives.

Effects from Fire Management

Fire management using planned and natural, unplanned ignitions to meet resource objectives generally have a positive effect on vegetation condition. Management direction in the revised Forest Plan emphasizes increased use of both planned and natural, unplanned ignitions to improve vegetation conditions. As discussed in the “General Effects” section, fire is generally beneficial to vegetation and is an important tool in moving vegetation towards desired condition. Compared to Alternative A, all of the Action Alternatives would utilize fire (both prescribed and natural, unplanned ignitions) to a much greater degree and that tool would improve the overall condition of the forest vegetation.

As described earlier in this document, fire suppression has a large effect on vegetation. In areas where wildland fire is suppressed, there will generally be less movement towards vegetation-desired condition. In lands within the WUI and near communities, a continued policy of heavy fire suppression will require that mechanical treatment methods be used in order to reduce hazardous fuels and trend the vegetation towards desired conditions. This effect is common to all alternatives.

Effects from Watershed, Soil, Riparian and Aquatic Habitat Management

The effects of watershed, soil, riparian and aquatic habitat management on upland forest vegetation are generally similar for all alternatives. All alternatives incorporate the direction from INFISH (USDA Forest Service 1995). They also contain direction to protect watershed integrity and soil productivity which can place limitations on how much and where vegetation treatment activities may occur as well as whether or not road access is available for mechanical treatments. Although it is difficult to quantify the effects, the anticipated result is a limitation on the amount of activities that can be undertaken in order to trend the forest vegetation towards desired condition.

Effects from Air Quality Management

The consequences to forest vegetation from air quality related Forest Plan direction are the same for all alternatives. All alternatives have direction to meet air quality standards established by federal and state agencies and to meet the requirements of state implementation plans and smoke management plans. This direction limits the use of natural, unplanned ignitions to manage forest vegetation by limiting how much can be burned and when and where it can occur. The costs of conducting prescribed fires increases as a result of the burning regulations, which affect how much is burned. Limited use of prescribed fire affects the ability to move vegetation towards desired condition under all alternatives.

Conclusion of Effects from the Alternatives on Forest Vegetation

After considering the effects that the various alternatives would have on all of the individual components discussed above (e.g., dominance types, size class, landscape pattern, snags, insects/diseases), the overall conclusions can be made regarding how the alternatives would affect the forest vegetation.

Regardless of the budget scenario, Alternative B Modified would generally trend the forest vegetation towards the desired conditions to the greatest degree. Alternative C would trend the vegetation towards the desired conditions slightly less than would Alternative B Modified, but both Alternatives B modified and C would be more beneficial than would Alternative D. Lastly, all of the Action Alternatives would improve the forest vegetation substantially more than would Alternative A.

If the IPNF were to receive a level of funding similar to that which would be needed to implement the unconstrained budget scenario, then much more progress could be made in trending the forest vegetation towards the desired conditions compared to the current budget level. Given the assumption that budget levels will remain similar to those that the IPNF has received in the recent past (i.e. assuming the constrained budget level), then only a small improvement would be made in trending the vegetation towards desired conditions.

Cumulative Effects

The effects that past activities have had on all of the components of forest vegetation (e.g., forest composition and structure, landscape pattern, etc.) were discussed in the "Affected Environment" section and are reflected in the current condition of the forest vegetation.

Therefore, unless otherwise noted, past activities are not carried forward into the following cumulative effects analysis. Present and foreseeable future activities that could affect forest vegetation are summarized below:

- **National Fire Plan, Healthy Forest Initiative, and Healthy Forest Restoration Act:** Since they were developed, these national level plans, initiatives, and acts (these are called "other plans" for the rest of this discussion) have influenced the vegetation and fuel management programs on the IPNF. Therefore, they have had some effects on forest vegetation and it is anticipated that they will continue to do so for the foreseeable future. In general, these "other plans" have resulted in more hazardous fuel vegetation treatments in the vicinity of WUI areas and fewer vegetation treatments in areas located away from communities. In addition, the types of fuel treatments that are being done in response to these other plans are often more expensive, and the social issues (i.e., effects of treatments on scenery, air quality, noise, wildlife viewing, etc.) can be more contentious. Therefore, higher public involvement, planning, and implementation expenses are likely to lead to fewer acres being treated within a given budget level.
- **Northern Region Integrated Restoration and Protection Strategy:** The Northern Region of the Forest Service has been working on a strategy and decision support model to help identify opportunities and priorities for integrated restoration and protection activities throughout the Region. This strategy is a component of the larger regional climate change adaptation strategy. In the future, this strategy has the potential to influence program level decisions on the IPNF by affecting where, when, and how forest vegetation treatments and protection activities occur. However, it is premature to speculate what the more specific effects may be once this strategy is implemented.
- **Conservation Efforts for Whitebark Pine:** As discussed in the "Affected Environment" section, the U.S. Fish and Wildlife Service recently determined that this tree species warranted listing as a threatened or endangered species but that it was precluded due to higher priority species. The species is now designated as a federal Candidate species and Region One has placed the species on the Sensitive Species list. As described in USDA Forest Service (2010 September), the forests in the region (including the IPNF), have been implementing various restoration efforts for this species and these activities will likely continue or intensify (contingent upon funding). If the tree species is eventually listed as a federal threatened or endangered species, there could be effects to the vegetation and fire management programs on the IPNF. Alternatives B Modified, C, and D contain Forest Plan components that stress the desire to increase the abundance and resiliency of this species to disturbances and stressors. If listed, there could be additional emphasis placed on restoration actions. As described in the "Affected Environment" section, Keane et al. (2012) recently published a range-wide restoration strategy for this tree species. Although the IPNF has a long history of implementing restoration projects for this tree, the comprehensive restoration strategy may have a beneficial impact of encouraging more efforts. However, as previously discussed the presence of habitat for wildlife species listed under the ESA make planning and implementing activities very difficult.
- **Climate Change:** Of all of the ongoing and foreseeable future actions that have the potential to affect forest vegetation on the IPNF, climate change is likely to be the single most important factor. The effects of climate change will likely combine with some of the effects that result from implementing the alternatives to produce cumulative impacts.

  The potential effects (and uncertainties) that climate change may have on forest vegetation on the IPNF are summarized in the KIPZ Climate Change Report (USDA Forest Service

2010b). In general, given the existing condition of the forest vegetation on the IPNF, the potential effects of climate change can be summarized as:

- ○ Increase in mountain pine beetle outbreaks in lodgepole pine and whitebark pine in relatively high elevation forests and a decrease at low-mid elevation;
- ○ Increase in western pine beetle/mountain pine beetle mortality in ponderosa pine during droughts or otherwise under moisture stress;
- ○ More root disease mortality and mortality from other insect/diseases during times of moisture stress;
- ○ Longer fire seasons with more frequent large fires and more annual area burned; and
- ○ Increase in the water balance deficit.

At the forestwide scale, the alternatives analyzed in this final EIS would generally add to the potential effects from climate change noted above. Alternative A would be the most affected and Alternatives B Modified and C the least affected by climate change. For all alternatives, the effects from climate change would be offset in those areas where vegetation treatments occur.

Climate change predictions for the Northern Rockies generally forecast warmer temperatures and longer, drier summers. If those predictions are correct, the effect of dense forests on the soil water balance could be compounded. In general, the soil water balance (especially in the summer droughty period) determines which tree species can ultimately survive on a specific site. Early seral tree species (e.g., ponderosa pine and western larch) have the unique ability to establish on bare soil surfaces where high surface temperatures exclude other species. One adaptation of these seral species is the deep rooting characteristic that allows the tree to find an adequate water supply and avoid extensive competition with shallow and fibrous rooted grasses and forbs. As the shade from these species limits shade-intolerant grasses and forbs, shade-tolerant tree species can become established in the understory. These species usually have shallower rooting characteristics that allow them to gather water from near the soil surface. The overall rooting structure on the site becomes much more competitive for water resources as succession progresses. As the density of the stand and the amount of leaf area increases, water transpiration increases, which in turn can deplete the water that is stored in the soil throughout the summer. The additional forest canopy interception of rain and snow which directly evaporates back into the atmosphere (snow sublimation) further compounds this effect and reduces soil water recharge. The end result is a water stressed forest, that not only becomes more susceptible to insect and disease, but also more prone to supporting severe wildfires because live fuel moisture is relatively low.

Whether it is invasive species (e.g., white pine blister rust), drought, uncharacteristic wildfires, elevated native insects and disease levels, unusually high forest densities, or some other agent or combination of agents that serves to stress trees and forest ecosystems, recent research suggests that climate change will likely exacerbate those stressors and “stress complexes” will continue to manifest themselves (McKenzie et al. 2009, Littell et al. 2010).

- **Human Population Increases and/or Shifts towards Wildland-Urban Interface:** For the last several decades, there has been more human development around the "edges" of lands administered by the IPNF. This trend is expected to continue in the future and is likely to have effects on the forest vegetation that are similar to those discussed above under the item titled "National Fire Plan, Healthy Forest Initiative, and Healthy Forest Restoration Act." In addition, with a greater number of people living and recreating in these wildland-urban interface areas, there is a greater probability of more human-caused ignitions that could have effects on the forest vegetation.

- **Increased Regulation and Concern over Smoke Emissions:** The ability to implement the vegetation treatments that would occur as a result of the alternatives is highly dependent upon prescribed burning (both associated with timber harvesting and without it) as well as using natural, unplanned ignitions to meet resource objectives. Therefore, to the extent that air quality regulations may become more stringent in regards to the quantity and timing of smoke emissions, there could be substantial effects in limiting vegetation treatments using prescribed burning.
- **Timber Product Manufacturing Infrastructure and Economics:** The ability of the IPNF to positively affect the forest vegetation is partially dependent upon the ability to sell forest products to manufacturing companies and to use the harvesting processes, including residual slash disposal activities. If the forest products industry declines in areas surrounding the IPNF to the degree that it is difficult to sell forest products, or if “stumpage prices” decrease significantly, it would affect how many acres could be treated. While some treatments could be accomplished by using prescribed burn-only treatments, it is generally too risky in the WUI and too expensive elsewhere.
- **Coeur d'Alene Basin Superfund Clean-up Efforts:** As described in more detail in the watershed section of this FEIS, activities associated with the clean-up of mining related heavy metals is ongoing and other associated activities are foreseeable. These activities will likely affect riparian vegetation in local areas where the activities occur in the basin. However, these activities primarily occur on lands that are not NFS lands and effects from these clean-up efforts would not have meaningful cumulative impacts when considered with the effects from the Alternatives associated with this revised Forest Plan.
- **Shared Border with Canada:** As described in more detail in the fire and fuels section of this FEIS, the northern portion of the IPNF shares an international border with Canada (British Columbia). As such, there may be some impacts regarding the management of wildfires and whether or not the use of natural, unplanned ignitions is appropriate on the IPNF when wildfires occur near the USA-Canadian border. As noted in the fire and fuels section, the general impact is that some natural, unplanned ignitions on the IPNF that may have otherwise been allowed to burn to meet resource objectives may become suppressed as a result of objectives or concerns raised by the Canadians. This could have a small negative impact on trending the forest vegetation on the IPNF towards desired conditions, but the degree of this effect is unknown.

Rare Plants

Introduction

The Forest Service has a legal requirement to maintain or improve habitat conditions for threatened, endangered, proposed, or candidate species under the ESA. Species covered under ESA are those listed by the USDI, U.S. Fish and Wildlife Service. Sensitive species are protected under the regional forester's Sensitive Species Program. The IPNF are required to identify and mitigate potential effects to these species from federal land-disturbing actions. In order to comply with the ESA and the Sensitive Species Program, forest botanists conduct inventories during project planning to locate and protect any threatened, endangered, proposed, candidate, and sensitive plant species.

Legal and Administrative Framework

Law and Executive Orders

- **The Forest and Rangelands Renewable Resources Planning Act of 1974:** Provides for maintenance of land productivity and the need to protect and improve the soil and water resources.
- **The National Forest Management Act (NFMA) of 1976:** "It is the policy of the Congress that all forested lands in the NFS shall be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth and conditions of stand designed to secure the maximum benefits of multiple use sustained yield. Plans developed shall provide for the diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet the overall multiple-use objectives, and within the multiple-use objective."
- **The Endangered Species Act (ESA) of 1973:** Requires federal agencies to conserve threatened and endangered species.

Key Indicator

- Potential for adverse effects on rare plants from ground-disturbing activities or other applicable threats or stressors.

Methodology and Analysis Process

The geographic scope of the analysis for effects to rare plants is the lands administered by the Forest. This area represents the NFS lands where changes may occur to rare plants or habitats from activities that result from the various alternatives. The rare plant species included in the analysis are those that are either listed under the ESA or are on the regional forester's Sensitive Species list. The known threats and/or stressors that have the potential to negatively affect the plant species were reviewed for each of seven plant habitat guilds. Potential adverse effects were considered based upon the likelihood and intensity to which the various alternatives may affect the threats/stressors.

Affected Environment (Existing Condition)

No threatened, endangered, proposed, or candidate plant species are known to occur on the IPNF. However, two threatened plant species, *Howellia aquatillis* (water howellia), and *Silene spaldingii* (Spalding's catchfly), are "suspected" on the Forest. Suspected species are those that are believed to have potential to occur on the Forest, but to date, have not been found.

Spalding's Catchfly (Silene spaldingii)

In 2001, the U.S. Fish & Wildlife Service (USFWS) listed *Silene spaldingii* as a threatened species (*Federal Register, Vol. 66, No. 196, 2001*). No populations of Spalding's catchfly have been found to date on the IPNF. According to USFWS, this species is suspected to occur on the IPNF in Kootenai, Shoshone, Benewah, and Latah Counties.

Habitat

Spalding's catchfly, a perennial herb of the carnation family, is a Pacific Northwest regional endemic plant. The plant is typically found in mesic, perennial grasslands and is known to occur in 52 populations in west-central Idaho, eastern Oregon, eastern Washington, northwest Montana, and British Columbia. Populations are often small and isolated. Its habitat is primarily dry grassland habitats and grassland inclusions in ponderosa pine and Douglas-fir forest. Suitable habitat for this species is typically dominated by fescues (*Festuca* species), blue bunch wheat grass (*Pseudoroegneria spicata*), and other bunchgrasses, but also has a high density of forbs. Some sites may have shrubs such as *Symphoricapos albus*, *Physocarpus malvaceus*, or *Rosa* spp. Soil types on which it has been found include loam, silty loam, granitic, loamy basaltic, and loess (Lorain 1991). Soils in its habitat are characterized as deep to moderately deep.

Threats

Endangered Species Act section 7 guidelines for Spalding's catchfly list seven management activities that potentially threaten habitat or populations. They are grazing, recreation, fire use, exotic species, pollinator impacts, herbicide and pesticide use, and habitat conversion.

Water Howellia (Howellia aqualitis)

The USFWS listed *Howellia aquatilis* (Gray) as a threatened species on July 14, 1994 (*Federal Register* Vol. 59, p. 35860). Critical habitat has not been defined or designated for *H. aquatilis* (*Federal Register Vol. 59, p. 35860*). Populations of this species are currently extant in California, Idaho, Montana, and Washington. These populations are threatened by loss or change of habitat due to natural and human-induced causes. According to the Conservation Strategy for *Howellia aquatilis* (USDA Forest Service 1994), there are currently 110 known occurrences of the species; most occurrences are in Montana and Washington, with only one known occurrence in Idaho in Latah County. Although no known populations occur on the IPNF, potential habitat may exist in the oxbows and river meanders on the Forest.

Habitat

Howellia aquatilis lives in shallow, vernal freshwater pools of wetlands, edges of larger ponds, or river oxbows that are abandoned or still hydrologically linked to the adjacent river system. Drying of the pools in the fall is necessary for germination and submergence in the spring is necessary for growth and flowering (Roe and Shelly 1992).

Threats

The following threats were documented in the recovery plan of water howellia (Shelly and Gamon 1996): timber harvest (siltation and hydrologic regime alteration), livestock grazing (trampling and soil compaction), non-native plant and noxious weed invasion, conversion of habitat, road construction and maintenance, military activities (in the Puget lowlands), fire effects, and natural conditions (lack of genetic variation, successional changes).

Sensitive Plant Species

Sensitive plant species that are known or suspected to occur in the IPNF are listed in table 23. Currently, there are 61 sensitive plant species that are known, suspected, or historically known to occur on the IPNF. The regional forester establishes and maintains the sensitive plant list. In response to new or changed information on the plant species, the regional forester occasionally adds or removes species. Therefore, the list is dynamic and will undoubtedly change in the future.

Distribution, habitat information, and population data for each species are available from the Idaho Conservation Data Center, Washington Natural Heritage Program, Montana Natural Heritage Program, and NatureServe databases.

The 1987 Forest Plan direction for sensitive and rare species, including plants, is to manage habitat to maintain population viability, to prevent the need for federal listing, and to determine the status and distribution of threatened, endangered, sensitive, and other rare plants. Habitat found to be suitable within project areas, and which could be affected by project-related activities, is surveyed to determine the presence of rare plant species. Protection measures are implemented to provide for the diversity of plant and animal communities following the NFMA and Forest Service policy.

Table 23. Rare Plant Species, Status, Occurrence, and Habitat Guilds on the IPNF

Scientific Name	Common Nate	Status[1]	Occurrence[2]	Habitat Guild[3]
Andromeda polifolia	Bog rosemary	S	K	P
Asplenium trichomanes	Maidenhair spleenwort	S	K	M
Aster junciformis	Rush aster	S	K	P
Astragalus microcystis	Least bladdery milkvetch	S	H	D
Betula pumila	Dwarf birch	S	K	P, D-R
Blechnum spicant	Deerfern	S	K	M
Botrychium ascendens	Upswept moonwort	S	K	M
Botrychium crenulatum	Dainty moonwort	S	K	M
Botrychium lanceolatum	Triangle moonwort	S	K	M
Botrychium lineare	Slender moonwort	S	H	M
Botrychium minganense	Mingan moonwort	S	K	M
Botrychium montanum	Western goblin	S	K	M
Botrychium paradoxum	Peculiar moonwort	S	K	M
Botrychium pedunculosum	Stalked moonwort	S	K	M
Botrychium pinnatum	Northwestern moonwort	S	K	M
Botrychium simplex	Least moonwort	S	K	M, D
Buxbaumia aphylla	Leafless bug-on-a-stick moss	S	S	M, S
Buxbaumia viridis	Green bug-on-a-stick moss	S	K	M
Cardamine constancei	Constance's bittercress	S	K	D-R, M
Carex buxbaumii	Buxbaum's sedge	S	K	P, M
Carex chordorrhiza	String-root sedge	S	K	A, P
Carex comosa	Bristly sedge	S	K	P
Carex flava	Yellow sedge	S	K	P

Scientific Name	Common Nate	Status[1]	Occurrence[2]	Habitat Guild[3]
Carex leptalea	Bristle-stalked sedge	S	K	P
Carex livida	Pale sedge	S	K	P
Carex paupercula	Poor sedge	S	K	P
Cicuta bulbifera	Bulb-bearing water hemlock	S	K	A, P
Cypripedium fasciculatum	Clustered lady's slipper	S	K	M, D
Cypripedium parviflorum var pubescens	Greater yellow lady’s slipper	S	K	M
Drosera intermedia	Spoon-leaved sundew	S	K	P
Dryopteris cristata	Crested shield fern	S	K	P
Epilobium palustre	Swamp willow weed	S	K	P
Epipactis gigantea	Giant helleborine	S	S	P
Eriophorum viridicarinatum	Green-keeled cotton grass	S	K	P
Gaultheria hispidula	Creeping snowberry	S	K	P, M
Grimmia brittoniae	Britton's dry rock moss	S	K	M, D
Grindelia howellii	Howell's gumweed	S	K	D
Hookeria lucens	Clear Moss	S	H	M
Howellia aquatilis	water howellia	T	S	A
Hypericum majus	Large Canadian St. Johnswort	S	K	P
Iris versicolor	Blue flag iris	S	K	P
Lycopodiella inundata	Northern bog clubmoss	S	K	P
Lycopodium dendroideum	Ground pine	S	K	D-R, M, C
Meesia longiseta	Meesia moss	S	K	P
Mimulus alsinoides	Chickweed monkeyflower	S	K	M, D
Phegopteris connectilis	Northern beechfern	S	K	M
Pinus albicaulis	Whitebark pine	S	K	C, S
Polystichum braunii	Braun's hollyfern	S	K	M
Rhizomnium nudum	Naked mnium	S	K	M
Rhynchospora alba	White beakrush	S	K	P
Salix candida	Hoary willow	S	K	P, D-R
Salix pedicellaris	Bog willow	S	K	P
Scheuchzeria palustris	Pod grass	S	K	P
Schoenoplectus subterminalis	Water clubrush	S	K	A, P
Silene spaldingii	Spalding's catchfly	T	S	D
Sphagnum mendocinum	Mendocine peatmoss	S	K	P
Streptopus streptopoides	Krushea	S	K	M, C
Thelypteris nevadensis	Sierra wood fern	S	S	M
Triantha occidentalis ssp. brevistyla	Short-styled sticky tofieldia	S	K	P, S
Trichophorum alpinum	Hudson's Bay bulrush	S	K	P
Trientalis arctica	Northern starflower	S	K	P
Vaccinium oxycoccos	Bog cranberry	S	K	P

Scientific Name	Common Nate	Status[1]	Occurrence[2]	Habitat Guild[3]
Waldsteinia idahoensis	Idaho barren strawberry	S	K	M

[1] Status: S = Sensitive; T = Threatened; E = Endangered

[2] Occurrence: K = Known; S = Suspected; H = Historically Known

[3] Habitat Guild: A = Aquatic, P = Peatland, DR = Deciduous Riparian, M = Moist Forest, D = Dry Forest, C = Cold Forest, S = Subalpine

Potential Threats

Threats are defined as activities (Forest Service or otherwise) or natural conditions that currently or potentially have negative effects on the diversity of rare plant communities or their habitat. Threats can be divided into the following three types: direct (e.g., livestock grazing (trampling), herbivory, recreational activities (hiking and associated trampling)), alteration of ecological factors (e.g., fire exclusion, insects, and disease), and habitat reduction (e.g., oil and gas exploration, road construction and reconstruction). Refer to the specialist report for a more inclusive list of examples for each of these three threats.

Habitat Guilds or Groups

Each of the IPNF rare plant species listed in table 23 was placed into appropriate habitat groups, or guilds. The term “guild” is used to mean a group of species that use similar resources in a similar way. These guilds include the following: aquatic, peatland, deciduous riparian, moist forest, dry forest, cold forest, and subalpine. Each of these guilds is briefly discussed below (see Specialist Report for more detailed discussion).

Aquatic Plant Habitat Guild

The aquatic plant habitat guild contains one federally listed threatened plant species and three sensitive species.

Several key stressors generally apply to most members of this species group. These include boating activities, lake shore development, aquatic non-native invasive species (especially *Phalaris arundinacea*), use of aquatic herbicides, agricultural practices, grazing and aquatic vegetation succession. Alteration of hydrologic regimes, either directly from drainage, ditching, and dam construction (or beaver dam removal); or indirectly from upland activities or events such as timber harvest, road construction, and wildfire are also potential stressors.

Stressors beyond Forest Service control include short- and long-term climate change (which may increase the risk of desiccation due to increased and prolonged summer temperatures and/or drought conditions) and activities as described above that occur on non-federal lands. These changes or activities could result in altered hydrologic regimes and/or species composition that may affect the persistence of aquatic group plant species.

Peatland Plant Habitat Guild

This species guild is composed of 31 sensitive plant species and is all nearly or completely restricted to peatland habitats; in numerous cases they co-occur at known peatland sites and the stressors and ecological processes that influence their habitats apply to all of them.

All of the peatlands on the IPNF are fens, although there are instances where microsites with bog characteristics occur within the fens; such cases are referred to as mixed mires (Chadde et al. 1998). These fen habitats can be further divided into five distinct sub-guilds that are characterized by different plant communities and species, different substrates, different pH, and different abiotic processes. Although the sub-guilds are distinct, individual peatland complexes often contain a mosaic of sub-guilds that grade into one another (poor fens, ombrotrophic bog, intermediate and rich fens, paludified forests, and shrub-carr). The sub-guilds are described in more detail in the Specialist Report in the project record.

Deciduous Riparian Plant Species Guild

This species guild contains four sensitive species.

The following stressors may have direct or indirect effects on plant species in deciduous riparian habitats:

- Management actions that alter hydrologic regimes;
- Alterations to riparian plant community succession through vegetation manipulation;
- Changes to natural disturbance regimes such as flooding;
- Management activities that affect water quality: such as road construction, reconstruction, and maintenance activities that result in runoff, livestock use, fertilizer application, and sedimentation from timber harvest activities;
- Invasive plant species;
- Off highway vehicle (OHV) use around wet margins of riparian areas; and
- Recreation use in and adjacent to riparian areas.

One stressor beyond Forest Service control includes long- and short-term climate change, which may increase the risk of desiccation due to increased and prolonged summer temperatures and/or drought conditions; and may alter the hydrologic regimes and floodplain dynamics that are important in the habitat of these species.

Wet and Moist Forest Plant Species Guild

This species guild contains twenty-nine sensitive species.

Key stressors affecting this species guild include timber harvest (especially regeneration of late seral and old growth cedar and hemlock forests), prescribed fire, road and trail construction, and other activities that could impact populations either directly through loss of individuals or indirectly through canopy removal or ground disturbance that disrupts soil mycorrhizae. Air pollution and removal of large, old trees may negatively affect lichens in this species group.

Stressors beyond Forest Service control include short- and long-term climate change (which may increase the risk of desiccation due to increased and prolonged summer temperatures and/or drought conditions), and activities as described above that occur or originate on other ownership lands.

Dry Forest Plant Species Group

This species guild consists of one federally listed threatened plant species and six sensitive species. The federally listed species (*Silene spaldingii*) is not currently known to occur on the IPNF, but suitable habitat is present and there is known occurrences near NFS lands.

Key stressors that affect this species guild include timber harvest, prescribed fire, severe wildfire, fire suppression efforts, grazing, and OHV use; all of which may directly or indirectly impact populations through ground disturbance, canopy removal, destruction of soil mycorrhizae, or increased risk of noxious weed invasion. Dry-forest and open-forest grassland habitats are relatively rare vegetation types on the IPNF, and the effects of these various stressors may be exacerbated in some areas as a result. Long-term fire exclusion and grazing exclusion may have detrimental effects on *Silene spaldingii* (Spalding's catchfly); the one federally listed threatened plant species in this group.

One stressor beyond Forest Service control includes short- and long-term climate change, which may increase the risk of desiccation due to increased and prolonged summer temperatures and/or drought conditions.

Cold and Forested Subalpine Plant Species Guild

Three sensitive species (including one tree (whitebark pine)) are assigned to one or both of these guilds.

For the non-tree species in this guild, the key stressors affecting this species guild include timber harvest, prescribed fire, road and trail construction, and other activities that could directly impact populations through vegetation and/or ground disturbance. For the whitebark pine, key stressors are fire suppression, white pine blister rust, mountain pine beetle, and climate change. Additional information on the existing condition for whitebark pine and the impacts of the alternatives is provided in the “Forest Vegetation” section of this EIS.

Subalpine Grassland Plant Species Guild

This species guild occurs in the non-forested portions of the subalpine zone and includes two sensitive species.

Several management activities and risks may have direct or indirect effects on rare plants in this species guild. These include disturbance associated with recreation use, trail construction (including blasting of rock), maintenance of fire lookouts and other administrative sites, and harvesting of special forest products. Invasion of exotic plant species may affect some rocky sites, but generally the harshness of these habitats inhibits complete dominance by such species.

One stressor beyond Forest Service control includes climate change, which may result in changes to snow amounts and distribution that affect these habitats. The possibility of desiccation due to increased and prolonged summer temperatures or drought conditions is also a potential stressor resulting from climate change, although the subalpine parks currently occupy areas that are subject to a higher degree of summer soil drying compared to surrounding sites (Roche and Busacca 1987).

Environmental Consequences

Forestwide Direction for all Alternatives

Threatened, endangered, proposed, or candidate species have special management requirements for all Forest Service management activities. The ESA section 7 guidelines and recovery objectives have been followed where potential habitat for the three threatened plant species known or suspected to occur on the Forest.

For sensitive species, management efforts to ensure the diversity of rare plant communities or their habitat are already in place. The Forest Service management policy (FSH 2609.25, 1.25, 1988 and FSM 2670) ensures that for all rare plant species, the following measures will be taken:

> (1) Biological evaluations will be written for all activities that may affect sensitive species and their habitat;

(2) "Effects" of activities will be determined as similar to those for threatened, endangered, or proposed species; and

(3) Special management emphasis will be included in all management activities to ensure the viability of the sensitive species and to preclude trends toward endangerment that would result in the need for federal listing. This Forest Service management policy will be employed at a species level in all alternatives to ensure its mandates are achieved and that sensitive species are conserved.

All of the alternatives implement the protection measures noted above for law, regulation, and policy. In addition, all of the alternatives (including Alternative A) retain INFISH as Forest Plan direction (revised Plan FW-STD-RIP-03). INFISH contains riparian management objectives for habitat conservation areas and a comprehensive set of standards and guidelines related to what kind of activities may or may not occur within the riparian areas. Although they were not specifically designed to do so, many of the standards and guidelines of INFISH serve as protection measures for rare plants that are associated with aquatic and/or riparian habitats, of which there are many. In addition, all action alternatives include management direction to evaluate proposed management activities and project areas for the presence of occupied or suitable habitat for "any plant species listed under the ESA or on the regional sensitive species list. If needed, conduct field review and provide mitigation or protection to maintain high-quality occurrences (those in intact, sustainable habitats) over time (FW-GDL-VEG-07)." This management direction ensures that surveys would be conducted and any protection measures applied, thereby reducing the potential for adverse effects.

Consequences to Rare Plants from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Management Area Direction

At the scale of the entire IPNF, it is important to realize the difficulties associated with assessing the impacts of broad Forest Plan direction to 60 rare plants. Plant species may be rare due to evolutionary history, basic population ecology, historic or current human activities, or more likely, a complex combination of these factors. Human activities may or may not be responsible for the current distribution and abundance of the rare plant species. However, an important assumption in this analysis is that certain management actions may contribute or detract from the availability or quality of habitats that support rare plant species.

Alternative A retains all of the 1987 Forest Plan direction regarding the management of vegetation, including rare plants. Forestwide goal #8 includes the desire to provide for a diversity of plant and animal communities and goal #11 indicates that habitat of animal and plant species listed under the ESA should be managed to provide for recovery. Forestwide standard number 9 states that habitat for species on the regional sensitive species list would be managed to prevent further declines in populations that could lead to federal listing under the ESA. All of the 1987 Forest Plan direction mentioned above is required as part of the laws, regulations, and policies previously mentioned.

In Alternatives B Modified, C, and D, MA1a and 1b, MA3 – Botanical Areas, and MA4 – Research Natural Areas would not allow certain management activities (e.g., timber harvest, grazing, motor vehicle use, road construction) which are considered threats to rare plants (see standards and guidelines for each MA in the revised Forest Plan). This direction is the same under each action alternative.

Effects from Specific Forest Plan Management Direction for Alternatives B Modified, C, and D

Forest Plan components that are relevant to rare plants are the same for each action alternative. Vegetation forestwide Goal-01 articulates the desire to have plant communities with high ecological integrity and exhibiting resiliency towards natural and man-caused disturbances. In addition, numerous forestwide desired conditions (i.e., FW-DC-VEG-01 through 08, and 11) for vegetation express the desire to trend the forest vegetation towards a more resilient condition with a high degree of ecological integrity. The management direction recognizes the need to maintain and/or improve the populations of the rare plants as well as the ecological roles and functions that they serve.

Action alternatives also contain specific components for rare plants (FW-DC-VEG-09, GDL-VEG-07) that address the need for field review and identification of mitigation and/or protection measures for site-specific proposed projects. This last guidance is also part of Forest Service Handbook and Manual direction (FSH 2609.25, FSM 2670).

Action alternatives also contain numerous forestwide goals, desired conditions, objectives, standards, and guidelines with regard to riparian and aquatic resources. Many of those Forest Plan components are designed to maintain or restore riparian conditions and aquatic resources. Many of the rare plants on the IPNF are associated with these types of habitats, and would benefit from implementing Forest Plan components related to riparian and aquatic resources (i.e., FW-GDL-RIP-05).

Effects from Fire (Planned Ignitions, Wildfires, and the Use of Natural, Unplanned Ignitions to meet Resource Objectives) Management

All of the alternatives use fire as a tool to accomplish management goals and objectives. The alternatives have different management emphasis areas and as such, the use and emphasis of fire vary by alternative. The biggest difference between the alternatives in this regard is that of Alternative A compared to the others. The use of fire as a management tool was not emphasized in the 1987 IPNF Forest Plan, in general, and with regard to using natural, unplanned ignitions to meet resource objectives. There are a number of barriers that prevented the IPNF from using that tool very often. Therefore, compared to the other alternatives, it is assumed that Alternative A would involve much less prescribed burning as well as the use of natural, unplanned ignitions to meet resource objectives. In considering the action alternatives, Alternative D has more emphasis on active management and commodity production than the others, while Alternative C has the least. Therefore, in general, it is assumed that of the action alternatives, Alternative D would involve more prescribed burning, while Alternative C would rely more heavily on the use of natural, unplanned ignitions as a management tool to help trend the forest vegetation towards the desired condition. In that regard, Alternative B Modified would fall between C and D.

Another factor that is important to some rare plants is the timing of burns. For example, the use of prescribed fire in the spring has potential impacts to some rare plants. In general, these plants are not adapted to fire at this time of year and spring burning can interfere with flowering, fruiting, and other physiological impacts; and could affect life history patterns with pollinators. However, those risks have to be weighed against the trade-offs in the event that prescribed burning could not take place at another time of year. Therefore, a higher risk occurs that an uncharacteristically intense wildfire occurs. Wild and prescribed fires can pose risks to those rare plants in the wet/moist and dry forest plant groups, particularly when the fires are uncharacteristic. In general, most plant species would benefit by the restoration of more historical fire regimes. For those rare plants that thrive in open areas created by fires, using fire to help restore a more natural fire regime could benefit those species in the long-term. There are also impacts to plants associated with wildfire suppression activities, such as fire line construction and other mechanical activities, reforestation following fire, and the increased potential for the spread of noxious weeds.

Effects from Recreational Management

Recreation impacts can include trampling, both by hikers and off-road vehicle use. Road building and the development of campgrounds and other facilities used by recreationists also contribute to plant impacts, as these developments make more areas accessible and concentrate use. Dispersed camping and recreation have similar impacts, which are more difficult to monitor. Parking areas, particularly undesignated areas, pose similar impacts to plants. In addition, there can be long-term impacts of bisecting a rare plant population with a road or similar feature and affecting the reproduction and/or plant dispersal. Other recreational impacts include off-road vehicle use, which can also disturb soil, affecting both habitat and potential habitat. Roads and trails for recreational use can contribute to the spread of noxious weeds and increase the accessibility of areas to livestock as well as native ungulates, which in turn can increase the impacts of trampling, herbivory, and congregation. Because some alternatives, for example, Alternative D, includes the potential for a higher level of recreational use, especially associated with motorized recreation, there are differences between alternatives on this factor. Action alternatives also contain specific components for rare plants (FW-DC-VEG-09, GDL-VEG-07) that address the need for field review and identification of mitigation and/or protection measures for site-specific proposed projects.

Effects from Vegetation Management

Mechanical activities include vegetation management treatments, whether for restoration or to meet timber production objectives. Activities such as logging can have impacts to plants and plant habitat through canopy removal, soil disturbance and erosion, and stream sedimentation. In addition, mechanical activities for vegetation treatment may require road building. Roads can increase access to and fragment habitat, thus providing an avenue for invasive plant species. They can be placed on ridgetops, in riparian areas, or through scree slopes, which are important habitats for a number of species. Reconstruction and maintenance of existing roads can directly or indirectly affect plant populations by introducing competitive weeds and altering availability of light, nutrients, and moisture. Sudden changes in seral stage, or an abundance of early seral stages, also reduce the available habitats for those plants that require mid-late seral stages. However, those species that prefer openings, early-seral stages, or some ground disturbance, could benefit from moderate levels of mechanical activities. As discussed above in fire, the restoration of historical fire regimes and restoration of conditions towards HRV with a range of seral stages for different potential vegetation groups may benefit some rare species in the long-term. With regard to the various alternatives, Alternative D is expected to have the greatest amount of mechanical activities and Alternative C the least. Alternative A and B Modified would be fairly similar. The management direction includes a guideline to evaluate proposed management activities and project areas for the presence of occupied or suitable habitat for “any plant species listed under the ESA or on the regional sensitive species list. If needed, conduct field review and provide mitigation or protection to maintain high-quality occurrences (those in intact, sustainable habitats) over time (FW-GDL-VEG-07).

Effects from Non-native Invasive Plants

Introduced, invasive plant species can displace rare species through competitive displacement. Indirect impacts include herbicide spraying and mechanical ground disturbance to control noxious weeds once they gain a foothold. Competition from invasive non-native species and noxious weeds can result in the loss of habitat, loss of pollinators, and decreased rare plant species viability. Roads, trails, livestock, and canopy reduction can provide ideal pathways for the introduction of exotic and non-native species. Indirectly, herbicide spraying can destroy populations of native pollinators by contaminating nesting materials and pollen resources, further decreasing the viability and reproductive success of rare species. Regarding the risk of weed invasions and/or expansion of populations, the alternatives vary in some ways. In general, the more emphasis the alternative has on active management the greater the likelihood of weed spread. All action alternatives contain a forestwide desired condition that states "new invasive plant species are treated and populations are contained or eradicated. Integrated pest management approaches are used, including best management practices (BMPs) that limit introduction, intensification and spread due to management activities. Areas requiring re-vegetation use locally adapted, native plant species where feasible and appropriate. Agreements with cooperative weed MAs assist in noxious weed and invasive plants control across jurisdictional boundaries" (FW-DC-VEG-10). Alternative D with its emphasis on active management, would be expected to have the greatest impacts on weeds, and at the other end of the spectrum, Alternative C would be expected to have the least impacts. The other alternatives fall between those two extremes.

Effects on Aquatic, Peatland, and Deciduous Riparian Species Guilds

These three habitat guilds will be analyzed together as they generally have similar types of threats for the rare plant that occur within them. Within these three guilds there are 39 sensitive species and one threatened species (water howellia). As mentioned earlier, there are no known locations of water howellia on the IPNF but potential habitat exists along river meanders and oxbows. Hydrologic and/or nutrient alternations are the two most important impacts that could occur to plants within these guilds. Mechanical vegetation treatments, off-road vehicles, roads and trails, grazing, and catastrophic wildfires are the most likely causes of Forest Service activities that could affect the hydrologic regimes or nutrient inputs. However, as previously mentioned the INFISH standards, guidelines, and other direction provide a fairly high level of protection for rare plants in these guilds. Those protections are in affect for all the alternatives. The action alternatives have additional protection measures and an increased emphasis on the restoration and maintenance of riparian and aquatic resources. Probably the most substantial risk to the plants in these guilds that has not been mitigated by INFISH or the other aquatic/riparian direction associated with the action alternatives, is the risk of a wildfire burning a large area and affecting either the hydrologic regime or nutrient inputs into these habitats. In comparing the action alternatives, Alternative C would likely pose the largest risk to plants in these guilds. Alternative C would rely heavily on fires to help trend the vegetation towards desired condition; and the use of a high level of prescribed fire or natural, unplanned ignitions has risks associated with it getting larger and/or more intense than desired. A large fire covering substantial area in these habitat guilds could make substantial changes in above and below ground water flows as well as nutrient inputs.

Effects on Wet and Moist Forest Plant Species Guild

On the IPNF, 27 sensitive species are assigned to either the wet or moist forest guild. Of the potential threats to plants in this guild, possible impacts from mechanical activities, fire, and noxious weeds are the most important. Many of the plants in this guild are somewhat sensitive to reductions in tree canopy cover and/or soil disturbance and many are commonly located in older late seral mature or old growth type forest stands. Because one of the general forest vegetation desired conditions is to increase the amount of old growth in the future, there may be more of this habitat in the future, barring large landscape scale wildfires.

Alternative D, because of the emphasis on an increased level of active management, is likely to have the greatest potential impact on rare plants in this guild. The plants in the wet guild would likely be protected from impacts from mechanical activities, due to the INFISH and/or aquatic and riparian Forest Plan components discussed earlier. In addition, the required field surveying that is conducted for projects would likely locate many of the populations and mitigation/protection measures would be established on a project specific basis. Relative to Alternative D, the risk of negatively affecting rare plants in these guilds is less for Alternative C, and Alternatives A and B Modified would rank between the other two.

Effects on Dry Forest Plant Species Guild

Six sensitive species and one federally listed threatened species (Spalding's catchfly) are grouped together in this dry forest species guild. As noted previously, there are no known populations of the Spalding's catchfly on the IPNF; however, potential habitat does exist. The threats associated with the rare plants in this guild are fire (both from fire suppression efforts as well as from the fires themselves), mechanical activities, grazing, and OHV recreation. Because field surveys are conducted for proposed activities, such as the use of prescribed fire and mechanical activities, the risk of harm from those causes is likely fairly low (FW-GDL-VEG-07). Greater risks likely exist due to wildfires burning under uncharacteristically intense conditions. Regarding the various alternatives, Alternative C, with less active management and its reliance on more fire, probably has a greater chance of causing negative effects to plants in this guild than do the other alternatives.

Effects on Cold Forest Plant Species Guild

Only two sensitive plant species occur in this guild, the ground pine club moss, and Krushea. Threats to these plants are primarily mechanical activities and fire. Forestwide guideline FW-GDL-VEG-07 would be applied under all action alternatives prior to trail construction or maintenance activities. Alternative D, with its greater emphasis on active management, would likely pose more risk to these plants than would the other alternatives.

Effects on Subalpine Grassland Plant Species Guild

Two sensitive plants occur in this subalpine guild, the short-styled sticky tofieldia, and the leafless-bug-on-a-stick moss. Because these plants are located at high elevations they tend to occur in IRAs, designated or recommended wilderness areas, or other remote locations. Trail construction or maintenance might affect these species, but probably the greatest threat is climate change. Forestwide guideline FW-GDL-VEG-07 would be applied under all action alternatives prior to trail construction or maintenance activities.

Cumulative Effects

The analysis area for cumulative effects includes all ownerships that comprise the IPNF. There are no cumulative effects from the decisions we are making in the revised Forest Plan except for past actions.

Under the influence of changing climate, if droughts and warmer winters continue, agents such as mountain pine beetle, Douglas-fir beetle, Western balsam bark beetle, and spruce beetle will likely show increased levels of activity. Fires are likely to increase in intensity under climatic influence if droughts continue and weather favorable to high intensity fire develops.

Non-native Invasive Plants

Introduction

Non-native plants are species that do not have their origin in a local area. They have not adapted to or evolved with the local environment, which means there are no natural enemies. Non-native plants include both exotics and noxious weeds. Exotic plants are species that have been introduced to an area, usually from a different continent. They may have been introduced inadvertently or intentionally.

Legal and Administrative Framework

Law and Executive Orders

- **Federal Noxious Weed Act of 1974:** States that each federal agency shall establish and adequately fund an undesirable plant management program; complete and implement cooperative agreements with state agencies regarding the management of undesirable plant species on federal lands under the agency's jurisdiction; and establish an integrated management system to control or contain undesirable plant species targeted under cooperative agreements.
- **Executive Order 13112:** Directs federal agencies to prevent the introduction of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally-sound manner; to monitor invasive species populations accurately and reliably; to provide for restoration of native species and habitat conditions in ecosystems that have been invaded; to conduct research on invasive species and develop technologies to prevent introduction; to provide for environmentally sound control of invasive species; and to promote public education on invasive species and the means to address them. All of these actions are subject to the availability of appropriations.
- **State of Montana County Noxious Weed Management Act:** States that it is unlawful for any person to permit any noxious weed to propagate or go to seed on the person's land, except that any person who adheres to the noxious weed management program of the person's weed management district or who has entered into and is in compliance with a noxious weed management agreement is considered to be in compliance with this section.
- **Idaho Noxious Weed Law:** States that it is unlawful for any individual to allow noxious weeds to propagate or go to seed on their land unless they are complying with an approved weed management plan. This law directs the counties to develop weed control districts to plan and implement weed control efforts. The law also directs district (county) weed boards to "make all reasonable efforts to develop and implement a noxious weed program covering all land within the district owned or administered by a federal agency."
- **Washington State Weed Law:** The primary noxious weed law (17.10 RCW) for Washington holds landowners, including state and county land agencies, responsible for controlling noxious weeds on their property. The law also established programs for administering the law, which is carried out by the Washington State Noxious Weed Control Board, the Washington Department of Agriculture, and the County and District Noxious Weed Control Boards.

Key Indicator

- Level of ground disturbing activities (e.g., timber harvesting, road and trail construction/reconstruction, fire suppression, grazing) and wildland fire (both prescribed fire and the use of natural, unplanned ignitions to meet resource objectives).

Methodology and Analysis Process

A weed risk assessment was conducted to evaluate the current risk of 20 species of weeds spreading and harming native plant communities. The methodology for that assessment is documented in project file records. The evaluation of how alternatives may impact the risk of new weed introductions and the spread of existing weeds was based primarily on what the relative opportunities are for ground disturbing activities and wildfire.

Affected Environment (Existing Condition)

The Federal Noxious Weed Act of 1974 defines a federal noxious weed as a “foreign origin as is new to or not widely prevalent within the United States, and can directly or indirectly injure crops… fish and wildlife resources or the public health.” Federal noxious weeds are specified as aquatic weeds, parasitic weeds, or terrestrial weeds. For the purpose of the management of noxious weeds on Forest Service lands, noxious weeds are considered to be “Those plant species designated as noxious weeds by the Secretary of Agriculture or by the responsible state official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof” (FSM 2080.5).

Most introduced species never became pests as they could not thrive without special care or they did not compete well with native vegetation, therefore, they remained confined to gardens or agricultural fields. Some even became valuable crop or landscaping plants. However, in the absence of competitors and natural enemies with which they evolved, a few exotic species spread and dominated to the detriment of native vegetation. For example, knapweed came into the United States from Eurasia in clover and alfalfa seed. Oxeye daisy was spread around the northwest in forage grass and legume seed after its introduction in the late 1800s. Intentional introductions have brought invasive weeds into the area as well. Common St. John's-wort seed was brought with English and German settlers as seed for gardens. Dalmatian toadflax came from Europe as an ornamental, as did orange hawkweed and absinth wormwood.

Noxious weeds are plant species designated by law that can have detrimental effects on agriculture, commerce, or public health. They spread aggressively and are difficult to manage. These species are generally new or not common to the United States. Noxious weeds generally present the most immediate and disruptive threat to ecosystems.

Noxious weeds, classified as invaders, pose the greatest threat as these plants are capable of becoming established in undisturbed or relatively undisturbed areas and have the ability to spread quickly over large areas. Spotted knapweed, diffuse knapweed, yellow star thistle, leafy spurge, and dyer’s woad are examples of invaders. These infestations can substantially change the biological diversity of areas by influencing the amount and distribution of native plants and animals; and negatively affect recreational experiences, forest regeneration, wildlife and livestock forage, soil productivity, fire regimes, and riparian and hydrologic function.

Various recreational and management activities that occur on the IPNF have the potential to disperse noxious weeds or increase the likelihood that they will become established at a given site. This increase in dispersal and establishment is above what would happen naturally as a result of seed transport by wind, water, or wildlife.

In Idaho, state laws and county ordinances require that all landowners be responsible for control of noxious weeds on their lands. The IPNF has several district-wide noxious weed environmental documents that provide an adaptive strategy to treat both existing and new weed infestations. Currently, the IPNF also partners with county, state, and other federal agencies in two Cooperative Weed Management Areas, which promote the integrated management and education on noxious weeds across jurisdictional boundaries.

Current control efforts are aimed at eradicating new invaders (table 24) and containing existing infestations. Every known site occupied by a new invader species is treated and monitored. Logging equipment is cleaned before entering a sale area to reduce the potential for the introduction of weed species not yet present in a sale area. Tactics used to attempt to contain large infestations include spraying roadsides, seeding major disturbances caused by road and skidtrail building and landing piles, and treating gravel pits. Biocontrols have been released for spotted knapweed, dalmatian toadflax, St. John's wort, purple loosestrife, and Canada thistle. Infestations in some sites have been reduced by these measures. However, in spite of these control efforts existing infestations continue to invade disturbed areas and impact plant communities.

On the IPNF, it is fairly common to see non-native, invasive plants along many roadsides, railroad and utility rights-of-way, and other disturbed areas, such as gravel pits. Spotted knapweed, tansy ragwort, rush skeleton weed, and other species have migrated away from the road right-of-way onto undisturbed hillsides, especially within the drier vegetation types. Weeds are also becoming established in harvest units where the seeds have been brought by machinery and other vectors such as wildlife, cattle, railcars, and/or wind. Table 24 lists the non-native invasive plants that are known to occur on the IPNF, as well as potential invaders. There are numerous differences across the IPNF with regard to the location of these plants, and the potential for additional invaders to become established. Table 24 summarizes the information for each of the three administrative zones on the Forests. Plants listed in table 24 as a potential invader (noted as PI in the table), are those that have not yet been located on the Forest but are known to be in the general area and are considered potential invaders. The management goal for those potential invaders is to prevent them from becoming established, and if found, eradicate them promptly. For the new invaders that are identified in the table (noted as NI in the table), there is a goal of eradicating any small infestations and reducing the larger ones. Lastly, for those plants that are recognized as widespread weeds (noted as WS in the table), the goal is to contain them inside areas that are already infested and reduce the plant populations.

Table 24. Non-native Invasive Plant Species that occur (or have the potential to occur) on the IPNF by Zone

Scientific Name	Common Name	Plant Status by Zone on the IPNF (PI=Potential Invader, NI=New Invader, WS=Widespread Invader)								
		North Zone			Central Zone			South Zone		
		PI	NI	WS	PI	NI	WS	PI	NI	WS
Achillea nobilis	Noble yarrow	X								
Acroptilon repens	Russian knapweed		X							
Anchusa arvensis	Small bugloss				X					
Anchusa officinalis	Common bugloss		X							
Alliaria petiolata	Garlic mustard	X								
Arctim minus	Common burdock		X							
Arctium lappa	Burdock					X			X	
Artemesia absinthium	Absinth wormwood			X			X			
Barbarea vulgaris	Garden yellowrocket		X							
Bassia scoparia	Burning bush	X								
Berteroa incana	Hoary alyssum		X							
Bromus tectorum	Cheatgrass			X			X			
Butomus umbellatus	Flowering rush	X								
Campanula rapunculoides	Creeping bellflower	X								
Caragana arorenscens	Siberian pea shrub		X							
Cardaria draba	Hoary cress, Whitetop		X		X					
Cardus nutans	Musk thistle				X				X	
Centauree dissusa	Diffuse knapweed		X			X				X
Centaurea nigrescens	Meadow Hawkweed			X						
Centaurea stoebe	Spotted knapweed			X			X			X
Centaurea debeauxii	Russian knapweed				X			X		
Centaurea solstitialis	Yellow starthistle				X				X	
Chaenorhinum minus	Dwarf snapdragon		X							
Chondrilla juncea	Rush skeletonweed		X				X		X	
Chrysanthemum leucanthemem	Oxeye daisy								X	
Cichorium intybus	Chicory			X		X		X		
Cirsium arvense	Canada thistle			X			X			X
Cirsium vulgare	Bull thistle			X			X			
Convolvulus arvensis	Field bindweed	X								
Conium maculatum	Poison hemlock			X		X				
Crupina vulgaris	Common crupina	X			X				X	
Cynoglossum officinale	Houndstongue			X		X			X	
Cytisus scoparius	Scotch broom		X			X				
Echium vulgare	Blueweed,Texas blueweed,Vipers Bugloss		X			X		X		

Scientific Name	Common Name	Plant Status by Zone on the IPNF (PI=Potential Invader, NI=New Invader, WS=Widespread Invader)								
		North Zone			Central Zone			South Zone		
		PI	NI	WS	PI	NI	WS	PI	NI	WS
Elaeagnus angustifolia	Russian olive		X							
Euphorbia esula	Leafy spurge		X			X	X			
Euphorbia cyparissius	Cypress spurge				X					
Euphorbia myrsinites	Myrtle spurge	X								
Hypochaeris radicata	Spotted cat's ear		X							
Hieracium aurantiacum	Orange hawkweed			X			X			X
Hieracium spp.	Meadow/Yellow hawkweed complex			X			X			X
Hypercium perforatum	St. Johnswort			X			X			X
Iris pseudacorus	Yellowflag iris		X			X		X		
Isatis tinctoria	Dyer's woad		X							
Knautia arvensis	Field scabious		X							
Kochia scoparia	Kochia		X							
Lepidium latifolium	Perennial pepperweed		X							
Lythrum spp.	Purple loosestrife		X			X		X		
Lathyrus latifolius	Perennial pea			X						
Leucanthemum vulgare	Oxeye daisy			X			X			
Linaria dalmatica	Dalmatian toadflax			X			X			X
Linaria vulgaris	Yellow toadflax, Common toadflax			X			X			X
Myriophyllum spicatum	Eurasion watermilfoil		X		X					
Matricaria discoidea	Pineapple weed			X						
Nardis stricta	Matgrass	X								
Onopordum acanthium	Scotch thistle		X		X					
Polygonium cuspidatum	Japanese knotweed		X			X			X	
Polygonum sachalinense	Giant knotweed	X						X		
Phalaris arundinacea	Reed canary grass			X						
Potentilla recta	Sulfur cinquefoil			X			X		X	
Potentilla argentea	Silvery cinquefoil		X							
Ranunculus acris	Tall buttercup	X			X			X		
Salvia aethiopis	Mediterranean sage	X								
Senecio jacobaea	Tansy ragwort		X			X				X
Solanum rostratum	Buffalobur	X			X					
Sorghum halepense	Johnsongrass	X								
Solanum elaeagnifolium	Silverleaf nightshade		X						X	
Sisymbrium altissimum	Tumble mustard			X						
Sonchus arvensis	Perennial sowthistle			X						
Solanum dulcamara	Climbing nightshade					X				
Tamarix. spp.	Saltcedar complex	X								

Scientific Name	Common Name	Plant Status by Zone on the IPNF (PI=Potential Invader, NI=New Invader, WS=Widespread Invader)								
		North Zone			Central Zone			South Zone		
		PI	NI	WS	PI	NI	WS	PI	NI	WS
Tanacetum vulgare	Common tansy			X			X			X
Tribulus terrestris	Puncturevine	X			X					
Tripleurospermum maritimum	Scentless chamomile		X							
Verbascum spp.	Mullein			X			X			X
Veronica chamaedrys	Germander speedwell			X						
Veronica officinalis	Common speedwell			X						

The list of non-native invasive plant species noted in the table 24 includes the applicable state of Idaho (as well as Washington and Montana) and county noxious weed lists as well as other species that the Forest considers important. Treatments for all weed species are an Integrated Pest Management approach that includes one, or a combination of the following:

- Biological – release of bio-agents;
- Mechanical – hand pulling, hoeing, clipping of seed heads, etc.;
- Chemical – application of herbicides; and
- Cultural – establishment of desirable plants as competition.

A weed risk assessment was conducted for the IPNF and with current levels of disturbance, it was estimated that approximately 48 percent of the Forest (1,199,900 acres) is at high risk, with 41 percent (1,030,000 acres) at moderate risk. Additional information developed from the weed risk assessment mentioned above is displayed in table 25. The weed risk assessment ratings in the table are a composite of 20 noxious weed species. The risk rating was based on individual components including disturbance, weed susceptibility, threat of weeds to native plant communities, and exposure. Methodology used in the assessment is documented in project file records.

Table 25. Acres by Weed Risk Rating for NFS Lands on the IPNF

Biophysical Group/ Forestwide	Weed Risk Rating	Acres	Percent of Biophysical Group/ Forestwide
Warm/Dry	High	304,400	82
Warm/Dry	Moderate	67,800	18
Warm/Dry Total		**372,200**	
Warm/Moist	High	769,400	52
Warm/Moist	Moderate	714,600	48
Warm/Moist Total		**1,484,000**	
Subalpine	High	126,100	20
Subalpine	Moderate	247,600	39
Subalpine	Low	269,100	42
Subalpine Total		**642,800**	
Water	None	1,500	

Biophysical Group/ Forestwide	Weed Risk Rating	Acres	Percent of Biophysical Group/ Forestwide
Water Total		**1,500**	
Forestwide	High	1,199,900	48
Forestwide	Moderate	1,030,000	41
Forestwide	Low	269,100	11
Forestwide	None	1,500	0
Forest Total		**2,500,500**	

Environmental Consequences

Management Direction for Alternative A

The 1987 Forest Plan contains very little management direction related to the management of non-native invasive plants. However, there is one forestwide objective (p II-7 and 8) for noxious weeds and it indicates that noxious weed control would be based on an integrated pest management approach and would be conducted in cooperation with counties, other agencies, and private landowners. The discussion associated with that objective acknowledged that the weed species already widespread could not be eradicated given budget constraints. Treatment priority was given to small infestations of new species.

Management Direction for Alternatives B Modified, C, and D

Relative to Alternative A, all of these action alternatives contain more management direction related to non-native invasive plants. For example, these alternatives contain forestwide desired condition statements (FW-DC-VEG-10) and objectives (FW-OBJ-VEG-02) that stress the need to treat new invaders and utilize BMPs that limit the introduction and spread from management activities. The integrated pest management approaches and BMPs being used in the region are described in FSM 2081. In addition to the forestwide direction noted above, these alternatives also contain additional direction for some specific MAs. All of the action alternatives contain numerous Forest Plan components (e.g., FW-DC-WTR-01; FW-DC-SOIL-01,02,03; FW-DC-RIP-04, 06; FW-DC-AQH-01; FW-OBJ-SOIL-01; FW-STD-RIP-03, 04; FW-DGL-RIP-03, 05; FW-GDL-ASQ-02) that would serve to protect watershed, soil, riparian, and aquatic conditions in ways that would reduce management caused disturbances in these areas that could otherwise increase weed spread or introduction.

Consequences to Non-native Invasive Plants from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Access and Recreation Management

Vehicles can carry noxious weeds when they pass through infestations or along the periphery of invasions where seeds or other plant parts occur (Sheley et al. 1999). Roadsides along major highways, general forest roads, and two-tracked roads are one of the primary mechanisms for the spread of these plants. Motorized, as well as non-motorized, recreation activities are also a common means for the spread of weeds. Recreational areas and facilities, such as trails, trailheads, and campgrounds receive a high amount of public use and soil disturbance and this facilitates weed introduction and spread. Recreationists can disperse seeds on their clothing, footwear, camping equipment, and vehicles (Sheley et al. 1999). Lastly, users of horse and pack stock may transport weed seeds in the supplemental feed that they use to feed their animals.

There are numerous weed prevention and control measures required by Forest Service policy (FSM 2081) for the management of roads and recreational activities. However, despite the use of those best measures, there is still a risk that new weeds could be introduced or existing weeds spread as a result of these types of activities. To the extent that the alternatives would affect the access and recreational activities or opportunities noted above, there would be consequences to the risk of weed introduction and spread. As discussed in more detail in the “Access and Recreation” topic, the management direction associated with the alternatives would not vary with regard to potential effects on motorized and non-motorized access and recreational opportunities on the IPNF. Therefore, the risk that weeds would be introduced and/or spread as a result of these activities is similar for all the alternatives. One small exception is that for Alternative C, on the central portion of the IPNF, there is an area where some motorized trails would be closed due to a proposed change in the MA designation; therefore, there may be a small reduction in the risk that those activities would spread weeds in that specific area.

Effects from Vegetation and Timber Management

Activities associated with timber harvest and mechanical fuels treatments, such as construction and use of roads, landings, and skid trails, disturb the soil and can create a more susceptible environment for the spread of weeds. Noxious weeds can also be introduced into an area by mechanical equipment associated with these activities. In addition, the use of prescribed fire associated with the management of vegetation can increase the likelihood for weed spread.

While there are numerous weed prevention and control measures required by Forest Service policy (FSM 2081) related to timber harvesting and other vegetation treatment activities, there is still a risk that these activities would result in spreading or introducing new weed species. As presented in the discussions for the “Vegetation” and “Timber” topics, the alternatives vary in the estimated amount of vegetation and timber treatments that would occur given the different management direction for each alternative; and under the two different budget scenarios. For the purpose of a general comparison between alternatives on how vegetation and timber related direction may affect the risk of weed introduction and spread, the number of acres of treatment can be used as an indicator.

Under the assumption that budget levels in the future will remain similar to current levels, Alternative A is predicted to result in the smallest number of acres being treated with timber harvest activities or prescribed fire (approximately 1.8 percent of the forested acres during the first decade), while Alternative C would result in the largest number of acres (approximately 4.2 percent) being treated during that time period. Alternatives B Modified and D are predicted to treat approximately 3.6 percent and 3.3 percent, respectively. If the budget constraint was removed, all the alternatives would treat more acres. Compared to the other alternatives, Alternative A would treat the smallest number of acres (approximately 2.8 percent), followed by Alternative D (4.5 percent), Alternative C (6.0 percent) and lastly, Alternative B Modified (6.2 percent).

Effects from Fire Management

Non-native invasive plants frequently invade sites following fires and sometimes it can occur on a large scale (Asher et al. 2000). In addition, wildfire suppression efforts often involve constructing control lines and requiring staging areas for fire equipment and fire camps. Control lines are usually dug down to bare mineral soil and can provide sites that are very vulnerable to weed establishment and spread. While there are many weed prevention and control measures that are required by Forest Service policy (FSM 2081) that are associated with the management of wildfires and prescribe fires, there is an increased risk of weed invasions and introductions in burned areas.

The relative risk among alternatives for prescribed fire was addressed above in the “Vegetation” and “Timber” paragraph. Therefore, the following discussion concerns risks associated from natural, unplanned fires that are managed to meet resource objectives. As described in more detail in the discussion of the “Fire” topic, the management direction associated with Alternatives B Modified, C, and D would result in an increased level of natural, unplanned ignitions being used to meet resource objectives compared to Alternative A. While it is difficult to predict the magnitude of the likely consequences, Alternatives B Modified, C, and D would result in higher risks for weed introduction and spread compared to Alternative A due to the increased amount of natural, unplanned ignitions managed to meet resource objectives.

Effects from Wildlife Management

As previously noted, wildlife species are one of the many mechanisms that serve to spread non-native invasive plants. Weed seeds, or parts of plants, can attach to the fur or feet of wildlife, or in some cases, are eaten and pass through animals and may be ready to germinate (Sheley et al. 1999). Therefore, to the degree that the various alternatives may affect wildlife populations, there could be some effects on the amount of weed spread that occurs. In addition, when conducting wildlife habitat restoration and improvement projects (for example prescribed burning to improve big game forage) one of the consequences may be that the site conditions are created that are more suitable for weed establishment and/or spread. However, the consequences of the wildlife-related management direction on the establishment and spread of non-native invasive plants is likely to be similar for all of the alternatives.

Effects from Watershed, Soil, Riparian and Aquatic Habitat Management

Noxious weed infestations are fairly common in some riparian areas on the IPNF. This is due to the availability of ample moisture, the high potential for weed seed transportation through stream systems, and in some instances, the high levels of public activity due to recreational activities in these areas. Some weed species are adapted to riparian areas.

While all the alternatives include the INFISH (USDA Forest Service 1995) direction that would serve to reduce weed spread/introductions in these areas, the action alternatives contain more protection measures. In addition, there are a number of soil-and water-related weed prevention and control measures required by Forest Service policy (FSM 2081) that are applicable for all alternatives.

Effects from Livestock Grazing Management

Livestock can transport weed seeds in their fur, wool, or manure (Sheley et al. 1999). In areas where livestock congregate, such as around watering sites, trails, corrals, and along fence lines, the high level of soil disturbance can create conditions for weed germination and spread. In addition, some weed species do not require bare soil to become established and can compete with native plants in riparian areas or other heavily vegetated areas in allotments.

As discussed in more detail in the “Livestock Grazing” section of this EIS, the amount of livestock grazing on the IPNF is not anticipated to vary due to the management direction associated with various alternatives. Therefore, the risk that livestock grazing activities would introduce and/or spread non-native invasive plants would be the same across all alternatives. There are numerous weed prevention and control measures required by Forest Service policy

(FSM 2081) related to livestock grazing, and they would be utilized under all alternatives to reduce the weed related risks associated with these activities.

Effects from Minerals, Lands, and Special Uses Management

Activities associated with locating and removing minerals and the issuance of special use permits or the acquisition, disposal, or exchange of lands can have consequences to the introduction and spread of noxious weeds. However, the Forest Plan components relating to those activities do not vary by alternative; therefore, the weed risks would be similar with each alternative. There are numerous weed prevention and control measures required by Forest Service policy (FSM 2081) related to lands, special uses, and minerals; and they would be utilized under all alternatives to reduce the weed related risks associated with these activities.

Cumulative Effects

The effects that past activities have had on the introduction and spread of non-native invasive plants were discussed in the “Affected Environment” section and are reflected in the current condition. Therefore, past activities are not carried forward into the following cumulative effects discussion. Present and foreseeable future activities that could have consequences are summarized below.

Human Population Increases and Additional Recreational Use of the IPNF: The regional population is expected to increase in the area surrounding the IPNF. As the human population increases in the region, it is expected that there will be more recreational use of the IPNF. Although it is anticipated all types of recreational use will increase, because of the aging demographics, there may be a slight increase in the motorized use versus more strenuous non-motorized activities. In general, both of these trends may increase the spread of weeds and/or the probability of new weed species being introduced. This effect would cumulatively add to those resulting from the alternatives.

Climate Change: As discussed in more detail in the KIPZ Climate Change Report (USDA Forest Service 2010b), climate change may increase the risk in the Northern Region of the spread of non-native invasive plant species but there is a lot of uncertainty surrounding any predictions. It is likely that some noxious weeds will likely expand as the climate changes and some may decline. However, if climate change results in more wildfire activity, as predicted, more area is likely to burn and the result would be an increase in highly suitable areas for weeds to spread to. As a result, climate change may directly or indirectly cumulatively add to the risks resulting from the alternatives.

Fire and Fuels Management

Introduction

Fire is an ecological process as well as a disturbance. In some ways, fire is similar to insects, diseases, wind events, floods, or ice storms. However, unlike other processes and disturbances, fire can also be used as a tool to manage natural resources. Land managers can plan for fire use in order to achieve management objectives; whether through the use of prescribed fire (i.e., a planned ignition) or natural, unplanned fire (i.e., ignited by lightning as opposed to humans).

Fire management programs oversee all aspects of fire suppression as well as the use of fire to meet management objectives. Fire suppression actions include a full range of options, from resource intensive (e.g., large numbers of personnel and equipment) to less intensive activities. The decision to use one or a combination of suppression strategies and tactics depends on management objectives and factors including such things as threats to life, property, and investments; fuel and weather conditions; natural resource objectives; terrain; and available resources such as personnel and equipment.

Legal and Administrative Framework

Law and Executive Orders

- **Organic Administration Act of June 4, 1897 (16 U.S.C. 551):** Authorizes the Secretary of Agriculture to make provisions for the protection of national forests against destruction by fire.
- **Bankhead-Jones Farm Tenant Act of July 22, 1937 (7 U.S.C. 1010, 1011):** Authorizes and directs the Secretary of Agriculture to develop a program of land conservation and land utilization to protect public lands.
- **Wilderness Act of September 3, 1964 (16 U.S.C. 1131, 1132):** Authorizes the Secretary of Agriculture to take such measures as may be necessary in the control of fire with designated wilderness.
- **National Forest Management Act (NFMA) of October 22, 1976 (16 U.S.C. 1600 et seq.):** Directs the Secretary of Agriculture to specify guidelines for land management plans to ensure protection of forest resources. Implementing regulations at Title 36, Part 219 of the Code of Federal Regulations (36 CFR 219.27) specify that consistent with the relative resource values involved, management prescriptions in forest plans must minimize serious or long-lasting hazards from wildfire.
- **Clean Air Act, as amended (42 U.S.C. 7401 et seq.):** Provides for the protection and enhancement of the nation’s resources and applies to the application and management of prescribed fire.
- **Economy Act of 1932, June 30, 1932 (41 U.S.C. 686):** Provides for procurement of materials, supplies, equipment, work, or services from other federal agencies.
- **Granger-Thye Act of April 24, 1950 (16 U.S.C. 572):** Authorizes expenditure of Forest Service funds to erect buildings, lookout towers, and other structures on land owned by states. It provides for the procurement and operation of aerial facilities and services for the protection and management of the national forests and other lands administered by the Forest Service.

- **Reciprocal Fire Protection Act of May 27, 1955 (42 U.S.C. 1856, Chapter 15A):** Authorizes reciprocal agreements with federal, state, and other wildland fire protection organizations.
- **Wildfire Suppression Assistance Act of April 7, 1989 (HR 4936):** Authorizes the Secretary of Agriculture to enter into agreements with fire organizations of foreign countries for assistance in wildfire protection.
- **Healthy Forest Restoration Act of 2003 (HR 1904):** Expedites the preparation and implementation of hazardous fuels projects on federal land and assisting rural communities, states, and landowners in restoring healthy forest conditions on state and private lands.

Regulation and Policy

- **The National Fire Plan:** Directs reduction of hazardous fuel and restoration of forest and rangeland. Includes a ten-year Comprehensive Strategy (2001) and implementation plan response developed by the Secretaries of Agriculture and the Interior, Western Governors, and other interested parties, for protecting communities and the environment. Coupled with the Federal Wildland Fire Management Policy (Interagency Federal Wildland Fire Policy Review Working Group 2001), the Plan forms a framework for federal agencies, states, tribes, local governments, and communities to reduce the threat of fire, to improve the condition of the land, to restore forest and rangeland health, and to reduce risk to communities.
- **The Healthy Forests Initiative:** Reduces administrative process to facilitate implementation of projects to reduce hazardous fuels and restore healthy ecological conditions on federal lands. The Healthy Forest Restoration Act, passed in December 2003, provides improved statutory processes for hazardous fuel reduction projects on certain types of at-risk NFS and Bureau of Land Management (BLM) lands. It also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships. Healthy Forest Restoration Act is intended to be consistent with, and supportive of, the community-based wildfire planning, watershed planning and related ongoing efforts under the National Fire Plan and Comprehensive Strategy.

Key Indicators

- How much, where, and under what conditions may planned ignitions and natural, unplanned ignitions be used to meet resource objectives on the Forest; and
- How much fuel treatment would the alternatives likely implement and the relative risk reduction that could occur.

Methodology and Analysis Process

The analysis area for fire is all lands on and within the IPNF. This area represents NFS lands where fire management activities may take place. Cumulative effects includes other land ownerships within and adjacent to lands administered by the IPNF, particularly in areas of wildland-urban interface. This larger area incorporates concerns to and from other landowners with regard to the potential effects on or from these intermingled properties. This approach is consistent with the coordination that occurs between states, counties, other federal agencies, and private landowners under the National Fire Plan and other fire management direction.

Affected Environment – Use of Fire for the Maintenance and Restoration of Fire-Adapted Ecosystems

The affected environment for the “Vegetation” section provides a comprehensive discussion on the historical and current role that fire has had on the IPNF, the types of wildfires that historically occurred on the IPNF and the ecological and environmental effects from fire suppression. That part of the “Vegetation” section provides a better appreciation for the importance that fire has on the maintenance of the biodiversity and productivity of ecosystems on the IPNF; and provides the overall context for understanding the environmental consequences of the alternatives presented in the “Environmental Consequences” section for this topic.

The AMS Technical Report (USDA Forest Service 2003 March) describes the number of wildfires that have occurred on the IPNF during the last 100 years. Historically, fire has played a significant role in ecosystem processes for vegetation on the Forests. Historical fire levels for the Forests were probably similar to the levels that occurred in the Interior Columbia Basin, which was 3 percent of the area in an “average” fire year and up to 6 percent of the area in an “active” fire year (Barrett et al. 1997). Based on wildfire and prescribed fire records for the last 10 years, the IPNF have averaged approximately 3 percent of its area. The IPNF have used prescribed burning as a tool to treat fuels, improve habitat, and reduce wildland fire risk for the past several decades. During the last 10 years, the IPNF have used prescribed burning on approximately 62,000 acres. Over a 3 year period (2007 to 2009) the number of wildfires per year that occurred on the IPNF ranged from 102 to 125 and the number of acres that burned annually from those fires varied from 132 to 431 acres (USDA Forest Service 2010).

Fire use as a tool can have adverse effects under certain conditions, even though it is an important ecosystem process. Current Forest Plan direction is intended to help define those situations where fire use will be limited or is not to be considered appropriate due to potential adverse resource or social-economic impacts. Part of the decision criteria to determine whether a lightning ignition will be managed to meet resource objectives is whether or not the fire would likely benefit or harm resources and be consistent with the Forest Plan direction.

Planned or natural, unplanned ignitions can help achieve certain management objectives. The use of either tool will occur within certain conditions or prescriptions. Prescribed fire and the use of natural, unplanned ignitions to meet resource objectives are likely to be implemented at different times during the burning season, and therefore, have somewhat different effects. Prescribed fires are often conducted in the spring and fall within burning “windows” that are developed to ensure that the effects meet resource management objectives. Conversely, lightning produces the natural, unplanned ignitions that may be managed to meet resource objectives. Most of the lightning storms that ignite wildfires on the IPNF occur in July and August. Therefore, the use of natural, unplanned ignitions to meet resource objectives may more often be implemented under drier conditions than those that would occur within prescribed fire burning windows. Prescribed fires implemented in the spring or fall would more likely be of lower intensities and severities than natural, unplanned ignitions during the summer. In addition, the potential size of the natural, unplanned ignitions that are being managed to meet resource objectives is likely greater than most planned fire ignition.

Environmental Consequences – Use of Fire for the Maintenance and Restoration of Fire-Adapted Ecosystems

Management Direction for Alternative A

The 1987 Forest Plan for the IPNF contains some direction regarding the role that fire should have on affecting the ecosystems. The forestwide goals (goal #23), objectives (item e, p. II-4, item g, p II-5, item s, p II-10) and standards (fire management section p. II-38) discuss management direction for fire in wilderness areas, the use of fire for creating big game forage, and suppressing wildfires that threaten old growth stands. Alternative A does not have any forestwide direction that provides an emphasis on the need to use fire as a tool to restore and/or maintain ecosystem composition, structure, or function. Most of the direction in the 1987 Forest Plan regarding fire is contained within the individual MA standards and guidelines.

There are 19 MAs in the 1987 Forest Plan that contain direction regarding the use of prescribed fire, the use of natural, unplanned ignitions and appropriate suppression strategies, and tactics in both critical and non-critical fire seasons.

Prescribed fire may be used in all MAs except MA17 and 18 (existing and proposed developed recreation and administrative areas, respectively). However, the use of natural, unplanned ignitions is fairly restrictive in the 1987 Forest Plan and some of the MA standards in the Plan serve as barriers for the use of this tool. For example, nine MAs (10, 13 through 20) have standards that do not allow the use of natural, unplanned ignitions and the acres that these MAs occupy is substantial; approximately 13 percent of the total acres on the IPNF.

The AMS identified several impediments to the use of fire in the 1987 Forest Plan. The MAs were numerous and generally small in size. Adjoining MAs often had different or unclear direction on the use of natural, unplanned ignitions; this resulted in creating a difficult situation for developing subsequent fire management plans and implementing an integrated fire management program. Also, because the 1987 Forest Plan did not contain an emphasis or much analysis on the use of fire (especially natural, unplanned ignitions), it was generally believed that the Plan did not adequately authorize the use of natural, unplanned ignitions to meet resource objectives.

Management Direction for Alternatives B Modified, C, and D

Alternatives B Modified, C, and D contain more specific forestwide and MA direction regarding the role that fire would have maintaining and/or restoring fire-adapted ecosystems. For example, each action alternative would contain forestwide desired condition FW-DC-FIRE-03 from the Plan, which states, “The use of wildland fire (both prescribed fire, and where appropriate, natural, unplanned ignitions) increases in many areas across the Forest. Fire plays an increased role in helping to trend the vegetation towards the desired conditions while serving other important ecosystem functions.” In addition, each of the alternatives would contain two forestwide objectives (FW-OBJ-FIRE-01 and 02) which indicate that fire would be used as a tool for both fuel reduction and ecosystem maintenance/restoration functions. The second of these objectives expresses the desire that at least 10 percent of the natural, unplanned ignitions would be managed to improve and/or maintain fire adapted ecosystems. Other forestwide direction (FW-DC-WL-15, FW-OBJ-VEG-01, and FW-GDL-VEG-01) that relates to vegetation or wildlife habitat would allocate fire to play a greater role as a management tool. At the scale of the individual MAs, all the action alternatives would contain desired conditions and guidelines from the Plan that would articulate what role fire should have and whether or not one or both of the principle fire tools (prescribed fire or the use of natural, unplanned ignitions) may be used. In general, many of the MAs express the desire to increase the use of fire as a tool (natural or prescribed) to trend the ecosystems toward the desired conditions. Some of the MAs, typically the ones that occupy small areas and contain resources and/or values that are more susceptible to being harmed by fire, contain limits or restrictions on the use of fire, especially natural, unplanned ignitions. These are research natural areas (MA4), primary recreation areas (MA7), and some historical or botanical special areas (MA3).

In summary, the management direction that is contained in all of the action alternatives is generally designed to encourage an increased use of fire (whether it be prescribed fire or using natural, unplanned ignitions) as a tool to assist in the restoration and maintenance of the various ecosystems on the IPNF. However, management direction also recognizes that in certain situations and locations, wildfires are undesirable because the risk of harming values is too great, and therefore, suppression action can be taken.

General Effects

The general effects that fire has on vegetation and forest ecosystems are presented in the "Affected Environment" section for vegetation. In addition, the effects of not using fire or suppressing wildfires are also discussed in that section.

Relative to Alternative A, Alternatives B Modified, C, and D would provide more opportunity and direction for the use of fire for the purposes of restoring or maintaining the fire-adapted ecosystems on the IPNF. The management direction associated with the action alternatives supports a substantial increase in the use of fire; both the use of prescribed fire as well as the use of natural, unplanned ignitions.

With regard to the action alternatives, the Forest Plan components that provide direction or otherwise influence the use of fire are similar. However, there are subtle differences in the mix of fire "tools" that are likely to be used under the various action alternatives. Relative to the other action alternatives Alternative D has a greater emphasis on the production of timber and the use of other active management techniques to trend the vegetation towards desired conditions. Therefore, the use of fire under Alternative D would likely result in a greater amount of prescribed fire (e.g., underburning and/or pile burning) used as opposed to natural, unplanned ignitions. In contrast, Alternative C would have the greatest emphasis on passive management; therefore, would more likely use natural, unplanned ignitions as the primary tool to trend towards desired vegetation conditions, relative to prescribed fire. Finally, the mix of fire tools used that would likely get used for Alternative B Modified would fall between that of C and D. With one small exception (MA4a – established and proposed RNAs), all of the MAs allow for the use of prescribed fire for the maintenance/restoration of the ecosystem (as well as other purposes). In addition, most of the MAs (and the vast majority of the total acres on the IPNF) allow the use of natural, unplanned ignitions as a restoration and maintenance tool. The special area MAs (MA3), the research natural areas (MA4a), experimental forests (MA4b), and primary recreation areas (MA7) generally do not allow the use of unplanned ignitions to meet resource objectives. For those areas, the risk that a natural, unplanned ignition would harm the values associated with those areas was considered too high.

Affected Environment – Wildland-Urban Interface

The wildland-urban interface (WUI) is the line, area, or zone where structures and other human developments meet or intermingle with wildland or vegetation fuels. Population growth has led to an increase in these interface areas. More and more people are living in small communities adjacent to the WUI. Throughout the West the number of communities threatened or affected by wildfire has increased. To address this concern, as well as concerns about the effects of wildfires on natural resources, the Secretaries of Agriculture and Interior were directed to develop a strategy to address severe wildland fires, reduce fire impacts on rural communities, and ensure effective firefighting capability in the future. This strategy, which includes national strategic and implementation goals and plans, budget requests and appropriations, and agency action plans, is known as the National Fire Plan.

The presence of the WUI areas affects all fire management decisions in those interface areas. While a wide range of fire management strategies are available to implement, these options are usually narrowed down in these zones due to concerns that fires may move from federal to private lands. Therefore, suppression costs are often higher adjacent to interface areas. In addition to the risk of wildfires moving from federal lands onto private lands, the risk of human-caused wildfires originating on private lands and spreading onto federally protected lands is increasing.

Currently, approximately 34 percent of the lands on the IPNF are within this WUI area[1] and the IPNF have been collaborating with other landowners and jurisdictions to reduce the risk of wildfires in these areas. Individual community protection plans have been created by the counties; and the IPNF has been working cooperatively to reduce the fuels and jointly make progress towards reducing risks.

Environmental Consequences – Wildland-Urban Interface

Management Direction for Alternative A

The 1987 Forest Plan does not contain specific Forest Plan components or other direction related to the need to address the fuel and fire hazards associated with the WUI area. However, since the Forest Plan was developed, a number of national policies, initiatives, and acts have emphasized the need to address this issue. As described in more detail in the cumulative effects discussion, national direction has had a large influence over fire management programs on the IPNF and in the way the 1987 Forest Plan has been implemented. For about a decade, the IPNF have focused its fuel reduction programs around the WUI and have collaborated with various counties in implementing their respective fire mitigation plans and programs. Therefore, although the 1987 Forest Plan does not contain direction on this, the implementation of the Plan is heavily influenced by national and local emphasis on the need to reduce fuel hazards in these areas.

Management Direction for Alternatives B Modified, C and D

All action alternatives would contain similar direction regarding WUI and hazardous fuel reduction. Forestwide desired conditions (FW-DC-FIRE-01, 02, 03) express the need to reduce hazardous fuels within the WUI as well as other areas where values are at risk; while recognizing that the public and firefighter safety is always a priority with all fire management activities. Specifically, FW-DC-FIRE-02 states:

> "Hazardous fuels are reduced within the WUI and other areas where values are at risk. Fire behavior characteristics and fuel conditions exist in these areas that allow for safe and effective fire management, as defined and characterized in county wildland fire mitigation plans. Fire behavior is characterized by low-intensity surface fire with limited crownfire potential. Forest conditions, and the

[1] This estimate was developed by using the various County Wildfire Protection Plans (CWPP's) and overlaying their WUI maps onto the IPNF ownership map and calculating acres and percent.

> pattern of conditions across the landscape, exist in these areas such that the risk is low for epidemic levels of bark beetles, high levels of root disease, and large scale, stand replacement fires."

In addition, these alternatives would contain forestwide direction regarding the objective of treating fuels (FW-OBJ-FIRE-01) with the highest priority for treatment in the WUI.

General Effects

As described above, relative to the 1987 Forest Plan, the action alternatives would contain more direction and emphasis on the need to treat fuels and lower wildfire risks in the WUI areas. For each of the action alternatives, the forestwide objective (FW-OBJ-FIRE-01) would be to treat fuels on NFS lands over approximately 6,000 to 16,000 acres annually and do so with an emphasis on placing those activities in WUI areas. As a result of those activities, the hazardous fuels in those WUI areas would likely be reduced. In addition, treatments on NFS lands in the WUI often adjoin other land owners/jurisdictions where additional fuel treatments are occurring. The result is a larger area where hazards would be mitigated.

Consequences to Fire from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Social and Economic Management

As opposed to Alternative A, the action alternatives all contain a forestwide desired condition (FW-DC-SES-04) component that states, "To the extent possible, the Forest contributes to the protection of communities and individuals from wildfire within the limits of firefighter safety and budgets." This desired condition provides additional emphasis (in addition to fire components previously discussed for the action alternatives) on the need for the IPNF to help protect communities. As a result, the action alternatives are more responsive to the issue of fire risk in the WUI and the need to reduce hazardous fuels as one of the measures to help protect communities.

Effects from Air Quality Management

The consequences to fire (both the use of fire for the maintenance/restoration of ecosystems, as well as using fire to reduce hazardous fuels in the WUI) from air quality related Forest Plan components are the same for all alternatives and would be similar to those presented for the vegetation topic. All action alternatives have Plan components (i.e., FW-DC-AQ-01, FW-GDL-AQ-01) that indicate that air quality standards established by federal and state agencies would be met and that the Forest Service would meet the requirements of state implementation plans and smoke management plans. Through experience implementing these components under the 1987 Forest Plan, it is apparent that the ability to use prescribed fire to manage forest vegetation is impacted. Often, obtaining the required smoke permissions to burn essentially serves to constrain how much can be burned and when and where it can occur. The costs of conducting prescribed fires increases as a result of the burning regulations, and to some degree, this affects how many acres would be burned. Because the use of fire is so important for the maintenance/restoration of the fire-adapted ecosystems on the IPNF, as well as a tool for hazardous fuel reduction activities, the consequences of this would be substantial.

Effects from Access and Recreation Management

The consequences to fire from access and recreation Forest Plan components are predicted to be fairly minor and are likely to be similar in nature for all alternatives. As discussed in the

"Vegetation" topic, in some circumstances, the use of fire may not be compatible with the scenic integrity objectives of High or Very High that were established along scenic travel routes and other important scenic areas; therefore, those components could have a small effect on the ability to use the fire tool for the maintenance/restoration of ecosystems. The consequences that would result from the no-action alternative as a result of Plan components in the 1987 Forest Plan (e.g., forestwide standard #1 under the Visual heading on page II-25 of the Plan) are fairly similar to the action alternatives.

Effects from Timber Management

As discussed above for Alternative A, the general direction in the 1987 Forest Plan for the MAs that included the production of timber as one of the objectives, was to suppress wildfires to provide the best benefit to cost ratio given the commercial value of the timber at risk. The action alternatives do not have this direction and emphasis on protecting timber values; therefore, one consequence is a greater opportunity in the action alternatives to allow natural, unplanned ignitions to burn and serve to help maintain/restore the fire adapted ecosystems.

Effects from Watershed, Soil, Riparian, and Aquatic Management

The consequences from watershed, soil, riparian, and aquatic related Forest Plan components on the ability to use fire for ecosystem maintenance/restoration or on the ability to reduce hazardous fuels in the WUI, would generally be similar for all alternatives. All alternatives incorporate the retained decision INFISH (USDA Forest Service 1995) and also contain various components to protect soil and aquatic resource. In order to meet the Plan direction associated with soil and aquatic resources there will likely be occasions where prescribed fire, or natural, unplanned ignitions, cannot be used due to potential negative effects that those activities could have on these resources. Road construction, reconstruction, or maintenance activities associated with mechanical fuel treatments may be needed but could be limited if there is potential for sediment delivery to the stream network. Although it is difficult to quantify the effects, protective measures directed towards soil and aquatic resources could limit the use of fire as a vegetation management tool or limit the amount of fuel treatments that could be undertaken in the WUI.

Effects from Wildlife Management

The ability to use fire as a tool to maintain and/or restore fire-adapted ecosystems is largely discussed in the forest "Vegetation" section. To be consistent with some of the wildlife components (i.e., FW-STD-WL-01, 03 and FW-GDL-WL-02) for grizzly bear, lynx, and caribou, the use of fire would be constrained somewhat in certain areas of the IPNF. However, all of the alternatives (including the no-action) would be affected in the same way.

One effect on vegetation from revised Forest Plan components related to wildlife is the desire to maintain or provide old growth or stands with old forest structures for terrestrial species associated with these habitats. To accomplish this, there may be a need to prevent old growth or stands with old forest structures from being lost to stand-replacing wildfires. These stands currently tend to be distributed over most of the landscapes on the IPNF and it may be necessary to consider if there would be some level of risk to stands managed for old growth. In minimizing the loss of these types of stands, one effect to vegetation may be that wildfires are suppressed more often, which could reduce the ability to achieve other aspects of the vegetation desired condition (such as increasing early-successional forests and shade-intolerant tree species). The 1987 Forest Plan contains a forestwide standard (item 2e under heading "Fire Management," page II-38) that wildfires would be suppressed if there was a risk of losing designated old growth (with the possible exception of wilderness areas). None of the action alternatives would contain this direction. Therefore, natural, unplanned ignitions would likely be suppressed more often under Alternative A than they would under the other alternatives.

Cumulative Effects

The effects that past activities have had on the two issues that are addressed above were discussed in the “Affected Environment” sections above and are reflected in the existing condition. Therefore, unless otherwise noted, past activities are not carried forward into the following cumulative effects analysis. Present and foreseeable future activities that could have effects on either the ability to use fire as a tool to maintain/restore fire-adapted ecosystems, or the fire risks in the WUI, are summarized below.

- **National Fire Plan, Healthy Forest Initiative, and Healthy Forest Restoration Act:** Since they were developed, these national level plans, initiatives, and acts (these are called "other plans" for the rest of this discussion) have influenced the vegetation and fuel management programs on the IPNF. Therefore, they have had some effects on hazardous fuels and it is anticipated that they will continue to do so for the foreseeable future. In general, these plans have resulted in more vegetation treatments being implemented in the vicinity of WUI areas with the objective of reducing hazardous fuels; and fewer vegetation treatments being conducted in areas located away from communities. In addition, the types of fuel treatments that are being used in response to these other plans are often more expensive and the social issues (i.e., effects of treatments on scenery, air quality, noise, wildlife viewing, etc.) can be more contentious. Therefore, higher public involvement, planning, and implementation expenses are likely to lead to fewer acres being treated within a given budget level. Not only do these other plans emphasize the need to reduce hazardous fuels in the WUI, but they also stress the need to restore the natural fire regimes and forest conditions to the larger national forest lands. These plans encourage the development of more resistant and resilient forest vegetation that would be less susceptible to large undesirable wildfires and/or insect outbreaks.
- **Northern Region Integrated Restoration and Protection Strategy:** The Northern Region of the Forest Service has been working on a strategy and a decision support model to help identify opportunities and priorities for integrated restoration and protection activities throughout the region. This strategy is a component of the larger regional climate change adaptation strategy. In the future, this strategy has the potential to influence program level decisions on the IPNF by affecting where, when, and how forest vegetation treatments and protection activities occur. One of the components of this strategy is focused on reducing hazardous fuels in the WUI. Another component emphasizes the need to develop more resistant and resilient forest conditions. It is premature to speculate what the more specific effects may be once this strategy is implemented, but in all likelihood the integrated restoration and protection strategy will result in an emphasis and provide some planning tools towards improving conditions in the WUI and greater forest areas.
- **Status Review of Whitebark Pine:** Recently, the U.S. Fish and Wildlife Service completed a status review of whitebark pine for potential listing as a threatened or endangered species. They concluded that the species warranted listing but was precluded because of the need to address higher priority species. Whitebark pine is now designated as a Candidate species. If it is listed at a later date, there could be effects to the fire management programs on the IPNF. In addition to the U.S. Fish and Wildlife Service’s review of the species, the regional forester has placed whitebark pine on the sensitive species list for Region One. While it may be too early to determine how these actions may influence the fire programs, one restoration strategy for this tree species may be to conduct more prescribed fire activities; or use more

natural, unplanned ignitions to meet resource objectives and create conditions for the maintenance and restoration of forest stands that either currently contain or are suitable for whitebark pine.

- **The Federal Land Assistance, Management, and Enhancement Act of 2009**: This act requires the Secretaries of the Interior and Agriculture to submit to Congress a report that contains a "cohesive wildfire management strategy." The Wildland Fire Leadership Council, therefore, directed the development of the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy). The Cohesive Strategy utilizes a collaborative, "from-the-ground-up" approach built through active involvement of all levels of government and non-governmental organizations, as well as the public, to seek national, all-lands solutions to wildland fire management issues. The National Cohesive Wildland Fire Management Strategy is an ongoing project that is being planned in three phases. Thus far, only the first phase has been completed and it is too early in the planning process of this national strategy to know, with much detail or certainty, how the strategy may influence programs and activities that occur on the IPNF. However, many of the elements and emphasis items in the Federal Land Assistance, Management, and Enhancement Act as well as the Cohesive Strategy report have already been considered and incorporated into the Forest Plan components of the action alternatives and/or the effects analysis. For example, the three key wildfire problem areas that were noted in the strategy report (Restore and Maintain Landscapes, Fire Adapted Communities, and Response to Fire) are very similar to a number of the Forest Plan revision topics that were identified and used to revise the Forest Plan direction. In addition, a number of the other elements in the Federal Land Assistance, Management, and Enhancement Act (i.e., using a full range of management responses to wildfires, allocating hazardous fuel reduction funds based on priorities, assessing impacts of climate change on wildfires) were considered in the Forest Plan revision process. Because of these reasons, when the national strategy is complete, it is likely that the revised Forest Plan direction (which is contained in all the action alternatives) will be consistent with that national strategy. For this reason, no cumulative effects are anticipated as a result of this national strategy.
- **Climate Change**: Of all the ongoing and foreseeable future actions that have the potential to affect fire, especially unwanted wildfire, climate change is likely to be the single most important factor. The effects of climate change will likely combine with some of the effects that result from implementing the alternatives, to produce cumulative impacts. The potential effects (and uncertainties) that climate change may have on the fire issues are summarized in the KIPZ Climate Change Report (USDA Forest Service 2010b). In general, the fire seasons are expected to become longer, large wildfires are expected to occur more often, and total area burned is expected to increase. By increasing the amount of prescribed fire use, as well as the amount of natural, unplanned ignitions that are used to meet resource objectives, the action alternatives would be expected to partially offset predicted effects from the climate change. The more fire use (and mechanical treatments) that occurs as a result of the action alternatives, the greater the fuels will be reduced and the forest vegetation restored to more resistant and resilient conditions, which would mitigate climate change effects.
- **Human Population Increases and/or Shifts towards Wildland-Urban Interface**: For the last several decades, there has been more human development occurring around the "edges" of lands administered by the IPNF. This trend is expected to continue in the future and is likely to have effects on the forest vegetation that are similar to those discussed above under the item titled "National Fire Plan, Healthy Forest Initiative, and Healthy Forest Restoration Act." In addition, with a greater number of people living and recreating in these wildland-

urban interface areas, there is a greater probability of more human-caused wildfire ignitions that could have effects on the forest vegetation.

- **Increased Regulation and Concern over Smoke Emissions**: The ability to use fire to maintain and/or restore the fire-adapted ecosystems on the IPNF, or to use fire to reduce hazardous fuels in the WUI, is highly dependent upon air quality regulations. Therefore, to the extent that air quality regulations may become more stringent in regards to the quantity and timing of smoke emissions, there could be substantial effects on the ability of the IPNF fire management program to utilize these fire tools. If past trends of increasing regulations and decreasing burn opportunities continue, the effects could be substantial and would likely result in not being able to use fire enough to make meaningful improvements to forest and fuel conditions and meet objectives.
- **Timber Product Manufacturing Infrastructure and Economics**: The ability of the IPNF to positively affect the forest vegetation is partially dependent upon the ability to sell forest products to manufacturing companies and to use the harvesting process (including the residual slash disposal activities) as a means to positively affect the forest vegetation and reduce hazardous fuels. If the forest products industry declines in areas surrounding the IPNF to the degree that it is difficult to sell forest products or "stumpage prices" decrease significantly, it would affect how many acres could be treated and fuels reduced. While some treatments could be accomplished by using prescribed burn only treatments, it is generally too risky in the WUI and very expensive elsewhere.
- **Shared Border with Canada:** The northern portion of the IPNF shares an international border with Canada (British Columbia). As such, there may be some impacts regarding the management of wildfires and whether or not the use of natural, unplanned ignitions is appropriate on the IPNF when wildfires occur near the USA-Canadian border. The Forest Service, as well as other federal and state agencies in the U.S., has an agreement with Canadian Officials from the province of British Columbia in Canada. The agreement is known as the Northwest Wildland Fire Protection Agreement or the Northwest Compact (Northwest Compact 2013). When a wildfire occurs on the IPNF in the vicinity of the border, communications occur between the IPNF and the British Columbia fire officials. The decisions associated with how a wildfire is managed in the U.S. near the border can be influenced by the concerns or objectives of the Canadians (and visa-versa). Because of this, the effect could be that some natural, unplanned ignitions that ignite on the IPNF that may have otherwise been allowed to burn to meet resource objectives on the IPNF could be suppressed or managed differently due to Canadian concerns. The impact on the forest vegetation on the IPNF could be a small negative impact in trending the forest vegetation on the IPNF towards desired conditions.

Watershed, Soils, Riparian, Aquatic Habitat, and Aquatic Species

Introduction

The revision topic Watersheds, Soils, Riparian, and Aquatic Resources considers numerous physical and biological resources such as: soil productivity, water quality, native and non-native desirable species, and aquatic habitats.

Legacy effects from past timber harvest, mining, and other human-caused disturbances continue to affect watershed health and the aquatic ecosystem. As amended by INFISH (USDA Forest Service 1995a and 1995b), the 1987 Forest Plan direction reduces the risk to watersheds and aquatic biota from new and ongoing activities. For some resources, INFISH standards and guidelines contain general direction for repairing past damage from land management associated with roads, grazing, and recreation activities. Generally, under the direction of the 1987 Forest Plan the intensity and the risks associated with new and ongoing developments and human-induced disturbances has been, and will be, greatly reduced as compared to the last several decades. However, they are likely to continue to accumulate and the press-nature of those disturbances still exists.

There will continue to be localized improvements to watershed, soil, riparian, and aquatic habitat conditions as projects are implemented, but wholesale watershed-scale improvements will occur more slowly given current and anticipated funding levels. With the direction and emphasis in the Forest Plan, watershed restoration may tend to be prioritized and directed by more commodity-based resource decisions, such as restoration associated with timber harvest activities and integrated vegetation restoration projects.

Improvements in soil productivity should be reflected through an ongoing reduction in timber harvest and increase in restoration and protection efforts. Additional guidelines provide further direction for soil nutrient management related to potassium limited soils, and other direction is designed to protect watershed health, improve soil quality, and maintain soil productivity.

Legal and Administrative Framework

Law and Executive Orders

- **Clean Water Act**: The Federal Water Pollution Control Act, or Clean Water Act, is the principal law concerned with polluting activity in the nation's streams, lakes, and estuaries. Originally enacted in 1948, it has been revised by amendments in 1972 (P.L. 92-500) that gave the act its current form and spelled out ambitious programs for water quality improvements that are now being put in place by industries and cities. Congress refined these amendments in 1977 (P.L. 95-217) and 1981 (P.L. 97-117). The 1987 amendments added:
    - A new Section 319 to the act, under which states were required to develop and implement programs to control nonpoint sources of pollution, or rainfall runoff from farm and urban areas, as well as construction, forestry, and mining sites.
    - Section 303(d) of the Clean Water Act requires states to identify pollutant-impaired water segments and develop "total maximum daily loads" that set the maximum amount of pollution that a water body can receive without violating water quality standards.
    - A water quality classification of streams and lakes to show support of beneficial uses.

    - Anti-degradation policies that protect water quality and stream conditions in systems where existing conditions exceed standards.
- **Organic Administration Act**: States that the mission of national forests is to "…provide favorable conditions of water flow…"
- **Multiple-Use Sustained-Yield Act of 1960**: Congress has affirmed the application of sustainability to the broad range of resources over which the USDA Forest Service has responsibility. Multiple Use Standard Yield Act confirms the USDA Forest Service's authority to manage the national forests and grasslands "for outdoor recreation, range, timber, watershed, and wildlife and fish purposes," (16 U.S.C. § 528), and does so without limiting the USDA Forest Service's broad discretion in determining the appropriate resource emphasis or levels of use of the lands of each national forest and grassland.
- **National Environmental Policy Act (NEPA) (1969):** Requires analysis of projects to insure the anticipated effects upon all resources within the project area are considered prior to project implementation (40CFR1502.16).
- **Endangered Species Act (1973), as amended**: Section 7(a) (1) supports biotic sustainability by requiring that, "All…federal agencies shall …utilize their authorities in furtherance of the purposes of this act by carrying out programs for the conservation of endangered species and threatened species…" Section 7(a) (2) of ESA includes direction that federal agencies, in consultation with the United States Fish and Wildlife Service, will not authorize, fund, or conduct actions that are likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat.
- **National Forest Management Act (NFMA) (1976)**: Directs the Forest Service to manage for a diversity of habitat to support viable populations (36 CFR 219.19). Regulations further state that the effects on these species and the reason for their choice as management indicator species need to be documented (36 CFR 219.19 (a) (1)).
- **Executive Order 11988**: Directs federal agencies to take action on federal lands to avoid, to the extent possible, the long-and short-term adverse impacts associated with the occupancy and modification of floodplains. Agencies are required to avoid the direct or indirect support of development on floodplains whenever there are reasonable alternatives and evaluate the potential effects of any proposed action on floodplains.
- **Executive Order 11990, as amended:** Requires federal agencies exercising statutory authority and leadership over federal lands to avoid to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. Where practicable, direct or indirect support of new construction in wetlands must be avoided. Federal agencies are required to preserve and enhance the natural and beneficial values of wetlands.
- **Executive Order 12962 (June 7, 1995)**: Acknowledges the recreational value of aquatic biota by stating the objectives "to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by: "(h) evaluating the effects of federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order."

Regulation and Policy

- **Forest Service Manual and Handbook Direction (Policy)**: Forest Service manuals and handbooks within the 2500 file code designation contain direction for soil and watershed management. Forest Service manuals and handbooks within the 2600 file code designation contain direction on species and habitat management that supports recovery of listed species and maintenance of viable populations on NFS lands.

Key Indicators

- Trend in watershed condition rating;
- Trend in soil productivity;
- Trend in water quality;
- Trend in riparian ecosystem function; and
- Trend in quality of aquatic habitats.

Methodology and Analysis Process

See appendix D in this EIS.

Analysis Area

The analysis area for aquatic systems includes most of the sub watersheds (6th level hydrologic units which are typically 10,000 to 40,000 acres in size) that contain, at least partially, NFS lands in north Idaho, the portion of northeast Washington that includes the Priest River Basin, and a small part of northwest Montana (figure 16). The analysis area also incorporates portions of the Kootenai River Basin in Idaho including the Moyie River; the lower end of the Clark Fork, mostly in Idaho to where it flows into Pend Oreille Lake; the Pend Oreille Lake Basin in its entirety and the Pend Oreille River in Idaho; the Priest River Basin in Idaho and Washington; the Spokane River Basin in Idaho including the major tributaries, the Coeur d'Alene River and the Saint Joe River as well as some tributaries to the lake itself and the Rathdrum Prairie; and the upper portion of the Little North Fork of the Clearwater River.

Some of these subwatersheds consist of blocks and scattered pieces of NFS, other federal, state, and privately held lands. Management of NFS lands often influences the watershed conditions and water resources at the scale of the watershed itself. Consequently, in areas of mixed ownership, reasonable assumptions of the management of those lands will be based on historic management and typical future activities.

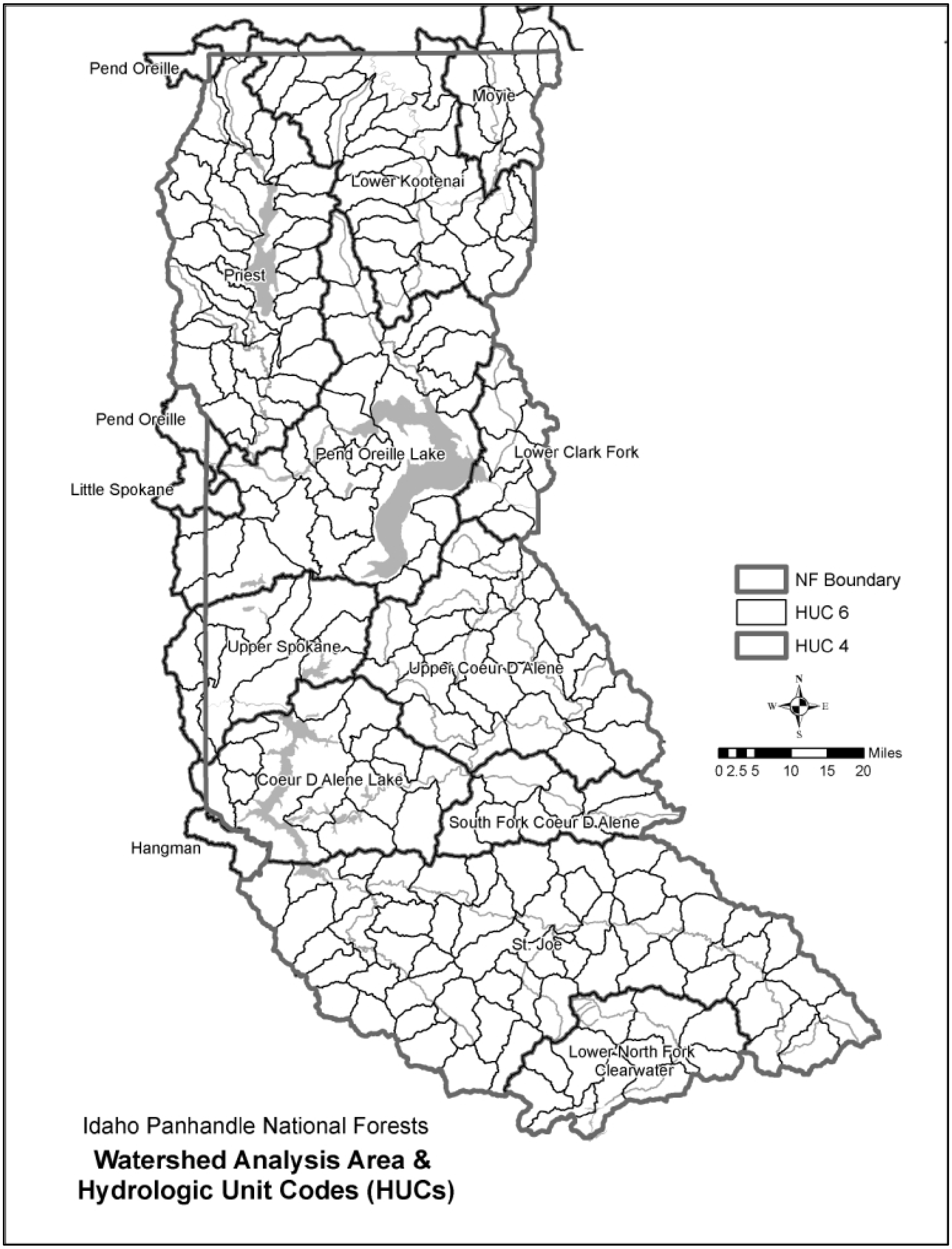


Figure 16. The Analysis Area and the Hierarchy of the Watersheds and the Hydrologic Unit Codes (HUCs). A sub-basin is a HUC4, and a subwatershed is a HUC6

Changes between Draft and Final

In development of the final EIS, the number of “conservation” subwatersheds changed from 13 to 48 and the number of “restoration” subwatersheds was increased from 82 to 96. The reason for the change was an oversight in the relationship between subwatershed condition and native species presence. Subwatersheds with redband trout or westslope cutthroat trout, in the absence of bull trout, were inadvertently not assigned a priority status in the draft EIS. These changes are reflected in the final EIS.

Affected Environment (Existing Condition)

The aquatic systems in the inland northwest evolved over millions of years under the influence of many geologic forces and processes. The present character and resiliency of the systems and the climate and geological processes have evolved following the last ice age, approximately 10,000 years ago. Since then the aquatic systems have been subject to a wide array of disturbances and events. These disturbances have often been intense and cyclic in nature and may appear to recur somewhat randomly, but with predictable frequency. The watersheds and their dependent resources have evolved under this “pulse” disturbance regime so that they can effectively respond to those natural disturbances while sustaining their long-term functions, processes, and condition. A pulse disturbance allows an ecosystem to remain within its normal bounds or domain and to recover the conditions that were present prior to disturbance (Reeves et al. 1995).

Around the beginning of the 20th century, the influx of human populations began in the inland northwest along with the development of the land and resources to support those populations. This has resulted in many new human-caused disturbances to the watershed systems, and the pattern of many of those disturbances has tended to be a more sustained or “press” disturbance regime. A press disturbance forces an ecosystem to a different domain or set of conditions (Reeves et al. 1995). Many of those disturbances tend to mimic historic “natural” processes, but the frequency and intensity has been greatly amplified. In some cases, the watershed systems have begun to adjust to those press disturbances, or have become altered by them; resulting in an inability to support aquatic dependent resources.

Human activities have altered stream channels by direct modification such as channelization, mining, removal of large woody debris, dams and diversions, log drives, and building infrastructure such as roads, railways, bridges, and culverts that have encroached on riparian areas and stream channels. Humans have also indirectly affected the incidence, frequency, and magnitude of disturbance events. This has affected inputs and outputs of sediment, water, and vegetation. These factors have combined to cause changes in channel conditions throughout many parts of the Forests resulting in aquatic and riparian habitat conditions measurably different from those that existed prior to human development. Natural (primarily wildfire) and human-caused (timber harvest and road construction, mining, dams, introduction of non-native species, recreation, fire suppression, and grazing) disturbances over the last century have led to changes in the physical watersheds and in the fish and amphibians dependent on them (Lee et al. 1997).

Roads can have some of the greatest effects to watersheds and aquatic biota. Roads can change the runoff characteristics of watersheds, increase erosion and sediment delivery to streams, and alter channel morphology (Furniss et al. 1991). These direct effects lead to changes in habitats for fish and amphibians. Roads also often fragment the habitat of these animals and may be a cause of death for migrating amphibians. Although current BMPs for road construction are designed to minimize the damage to watersheds, many miles of road existing on the landscape were not built to these standards or are no longer maintained. As a result, these roads either continue to degrade watersheds through chronic erosion or are at risk for mass failure from crossings or locations on sensitive land types.

Watersheds

The primary hydrologic unit upon which watershed condition and has been assessed is the 6th-level hydrologic unit (subwatershed). To evaluate baseline watershed conditions across the analysis area, a watershed condition rating was determined for each subwatershed. This characterization estimated the existing condition based on physical characteristics (e.g., hydrologic, geomorphic, landscape, topographic, vegetation cover, and aquatic habitat) and human caused disturbances (e.g., road construction and vegetation treatments).

Three factors were used in the watershed characterization process: 1) inherent watershed sensitivity; 2) level of riparian disturbance (described in the subsequent "Riparian" resources section); and 3) watershed disturbances from land management activities (see appendix D). Table 28 shows the distribution of Watershed Condition Ratings across the entire Forest.

Watershed Condition Ratings serve to identify subwatershed function based on inherent watershed sensitivity and disturbances from current and past land management activities, such as road construction and vegetation treatments. These ratings represent an indicator of overall watershed health at a large scale and provide a reference point to evaluate the past, current, and future trends of soil and aquatic resource conditions. They also identify priority areas for restoration and comprehensive recovery that may help to reduce the management level threats associated with a decline of aquatic species and legacy effects to their habitats. The ratings evaluate physical components that influence aquatic systems and terrestrial uplands that influence riparian functions and ecological processes. Ratings provide a consistent line of reasoning to recognize when, where, and why adverse, beneficial, or no effects may occur to related resources at a large scale. These watershed indicators are not independent from other components of the Plan, but provide a baseline to understand the current and desired conditions for uplands, riparian areas, water quality, and aquatic habitats. These ratings provides a framework to assist specialists and decision makers in ensuring that management actions will not limit or prevent attainment of desired conditions for aquatic resources.

1) Watershed sensitivity provides an indication of drainage's inherent sensitivity with regards to both human and natural disturbances, as well as potential for recovery, following disturbance. Watershed Sensitivity Ratings are based on sensitive snow rating and sensitive land type. Sensitive snow rating is considered the proportion of a subwatershed between 3,000 and 4,500 feet elevation, which represents snowpack that is typically near ripe (i.e., minimal cold content) through most of the winter season. Sensitive snow exhibits rapid conversion from ice to liquid or water vapor as a result of warm moist air masses typical to north Idaho and western Montana during winter. This conversion results in exceptional heat transfer and snowpack with limited cold content to satisfy the heat transfer rapidly melt. When large amounts of snowpack undergo this process, high intensity and widespread flooding is likely to occur in a subwatershed. Subwatersheds across the planning unit appear to have a relatively high sensitivity to natural or human caused disturbances (table 26), when considering climatic and land type variables, with a majority of these subwatersheds located in the southern portion of the Forest (figure 17 and 18).

2) Riparian disturbance is described further in the "Riparian" section below.

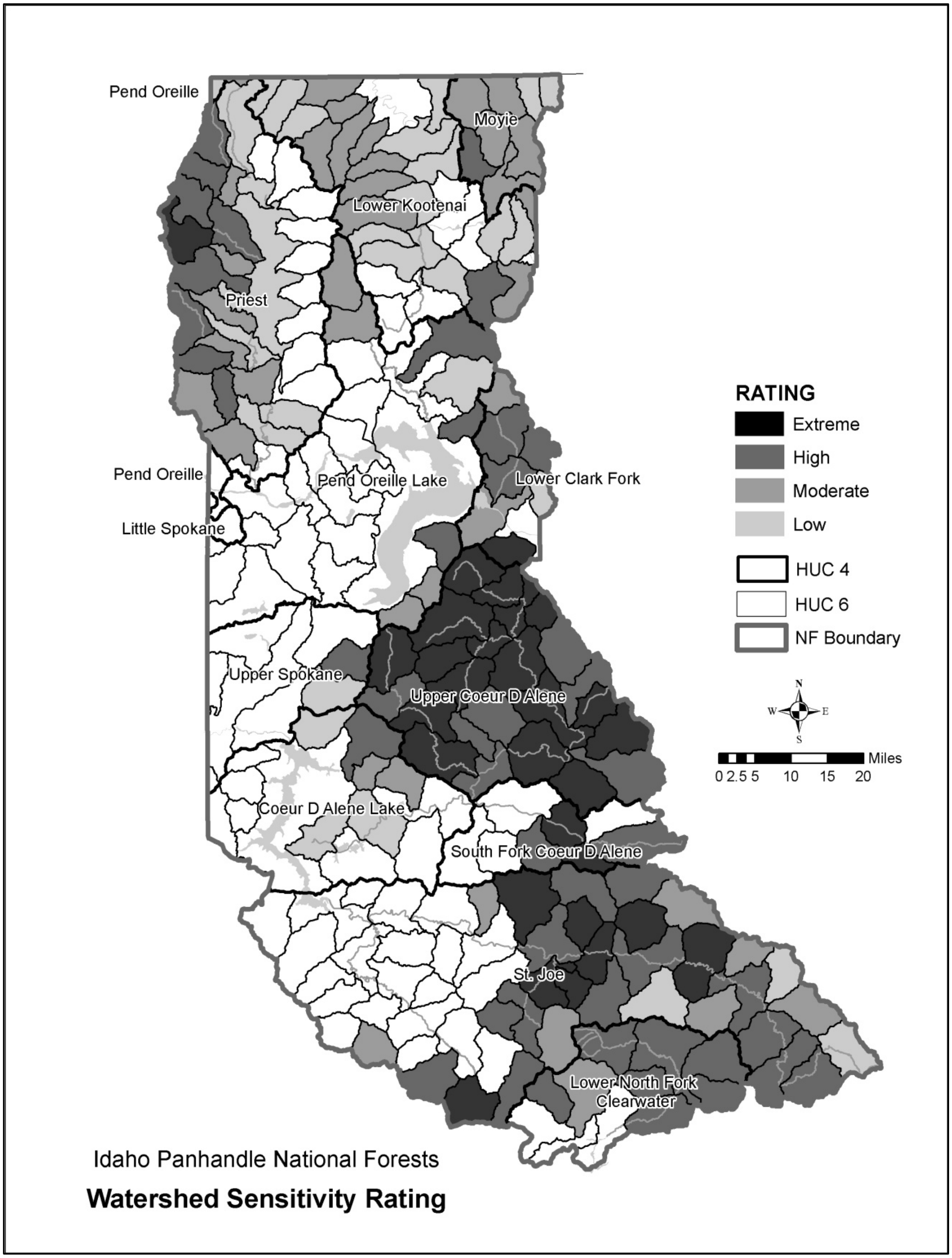


Figure 17. IPNF Watershed Sensitivity Rating

Table 26. Watershed Sensitivity Rating, Forestwide

Watershed Sensitivity Rating	Number of Subwatersheds (% of Forest)
Low	30 (21%)
Moderate	40 (27%)
High	47 (32%)
Extreme	29 (20%)
Total	**146**

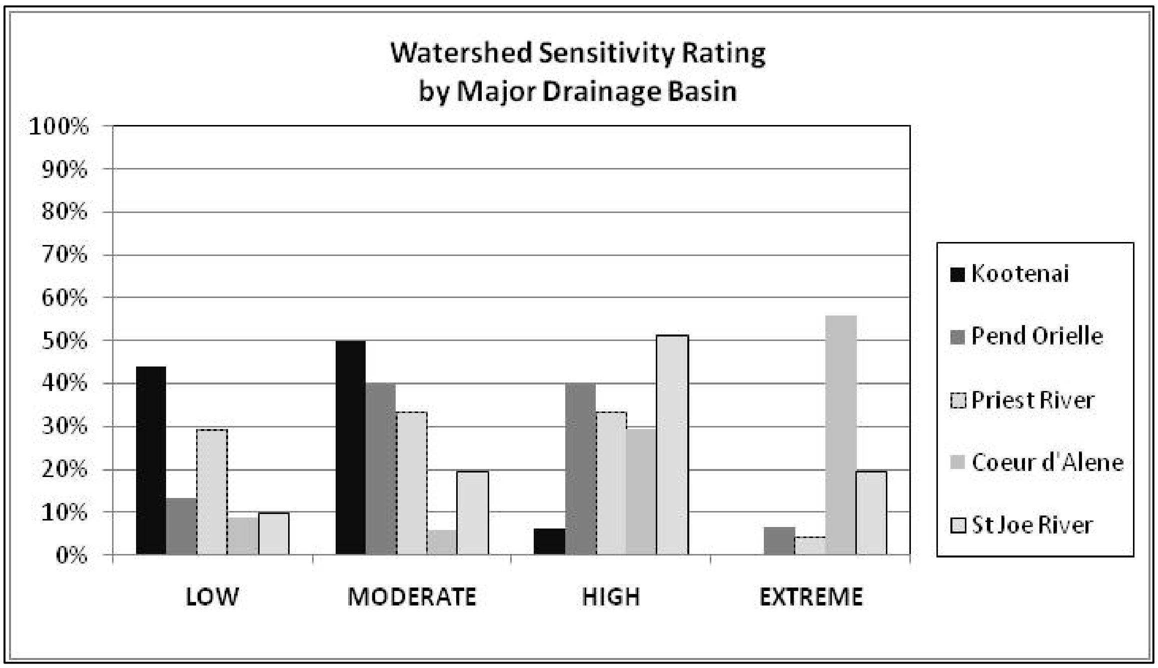


Figure 18. Watershed Sensitivity Rating by Major Drainage Basin

3) Watershed Disturbance Ratings, also used to evaluate watershed condition, provide an estimate of the relative amount of human caused disturbances across subwatersheds and takes into account the following factors: road density, road density on sensitive land types, stream crossing frequency, detrimental soil disturbance, and equivalent clearcut acres. See appendix D, for a more detailed discussion of the analysis for determining Watershed Disturbance Ratings. Based on that analysis, almost 85 percent of the Forest is considered to have a low to moderate level of human disturbances, with most of the higher levels of human influences occurring in the southern portion of the planning area (figure 19 and 20) and are assumed to be associated with more historically active management, in the form of vegetation treatments, road construction, and mining activities. Table 27 shows the distribution of Watershed Disturbance Ratings across the Forest.

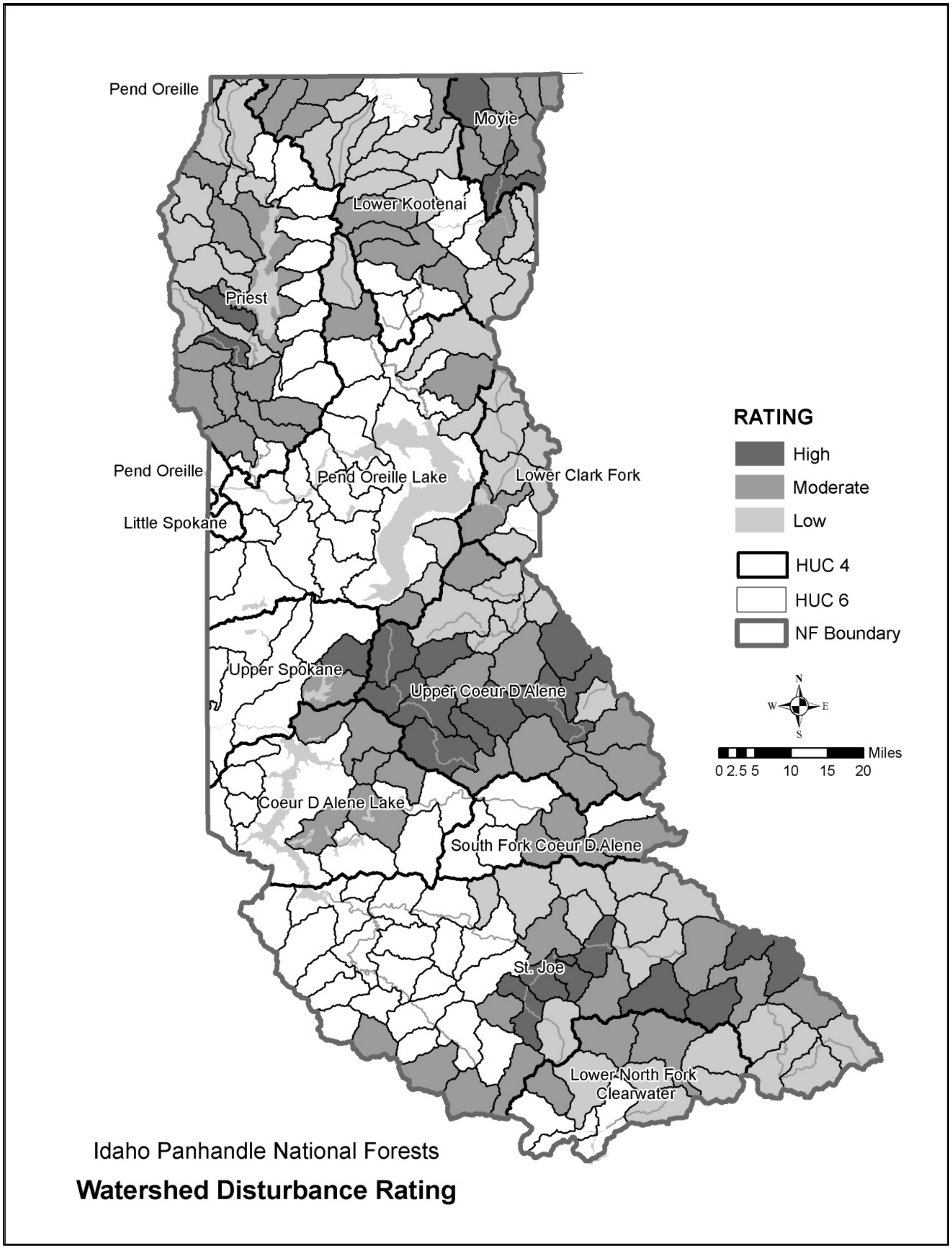


Figure 19. IPNF Watershed Disturbance Rating

Table 27. Watershed Disturbance Rating, Forestwide

Watershed Disturbance Rating	Number of Subwatersheds (% of Forest)
Low	61 (42%)
Moderate	62 (42%)
High	23 (16%)
Extreme	0 (0%)
Total	**146**

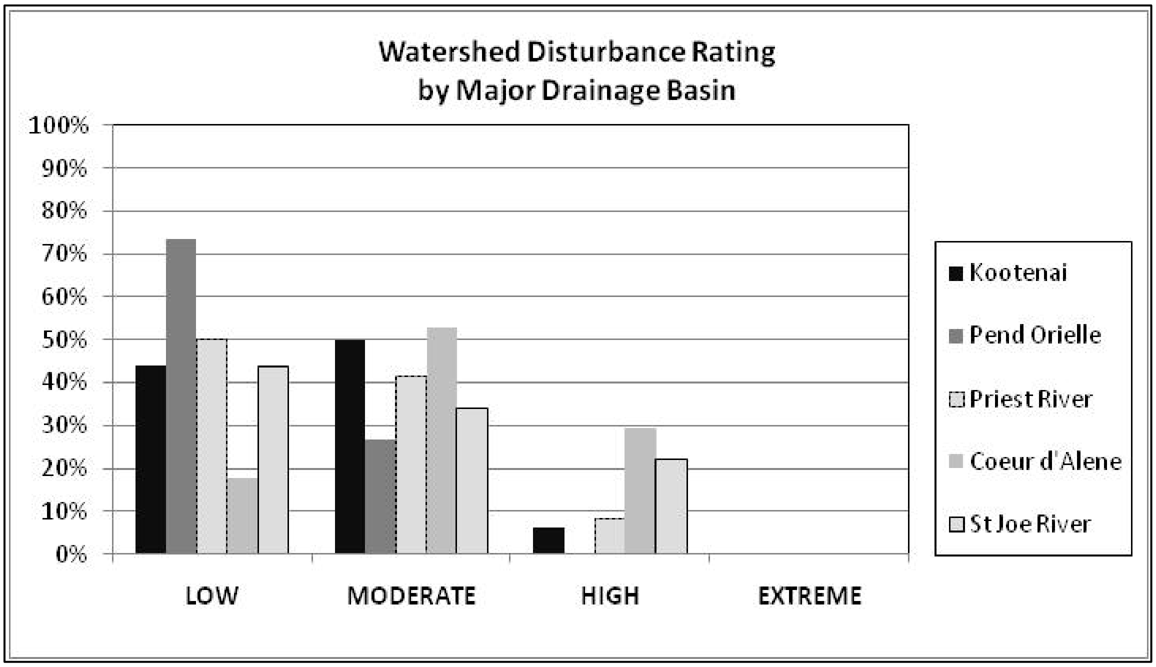


Figure 20. watershed disturbance rating by major drainage basin

The following descriptions provide a basic summary for interpreting Watershed Condition Ratings. It should be noted that a given subwatershed may have different combinations of watershed sensitivity and watershed/riparian disturbance and these are only general descriptions to assist the reader. For example, it is possible for a subwatershed to have a low level of sensitivity and a high level of disturbance, providing an overall rating of “moderate.” Appendix D provides details of the analysis used to determine Watershed Condition Ratings for subwatersheds on the Forest. Final Watershed Condition Ratings may also include professional judgment in some cases. Review by resource specialists, with local ground-based knowledge and site-specific data, may have resulted in a change to a condition rating and those changes are noted in the fields “override” and “comments” (see appendix D).

Subwatersheds rated as “low” generally have a relative low inherent sensitivity to disturbances and low level of overall disturbance. These subwatersheds exhibit geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. The drainage network is generally stable. Soil, aquatic, and riparian systems are assumed to be functional, in terms of supporting beneficial uses.

A rating of “moderate” generally indicates a subwatershed with a low to moderate inherent sensitivity and/or a low to moderate level of disturbances. Subwatersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. Portions of these subwatersheds may exhibit an unstable drainage network. Soil, aquatic, and riparian systems may or may not support beneficial uses.

In general, subwatersheds rated as “high” have a relatively higher sensitivity to natural and human-caused natural disturbances and relatively higher level of overall disturbances. These subwatersheds may have limited geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. A majority of the drainage network may be unstable. It is assumed that beneficial uses may not be supported.

Subwatersheds with less than 25 percent land area under Forest Service jurisdiction were not considered in the analysis. This is due, in part, to limitations in data availability and an assumption that there are enough factors beyond agency control that reduces the agency’s ability to effectively change conditions at that scale. Detailed information related to the methodology used to determine watershed condition can be found in appendix D.

Figure 21 displays the Watershed Condition Ratings by subwatershed. Table 28 summarizes the proportion of the Forest subwatersheds by category. Figure 22 displays subwatershed conditions by major river basin(s). Data indicates that the Coeur d’Alene River basin has a relatively higher proportion of land area with a high sensitivity to disturbance, is in a disturbed condition, or a combination of both, and the Pend Oreille basin has the highest percentage of subwatersheds in a functioning condition with regards to sensitivity and/or human caused disturbance.

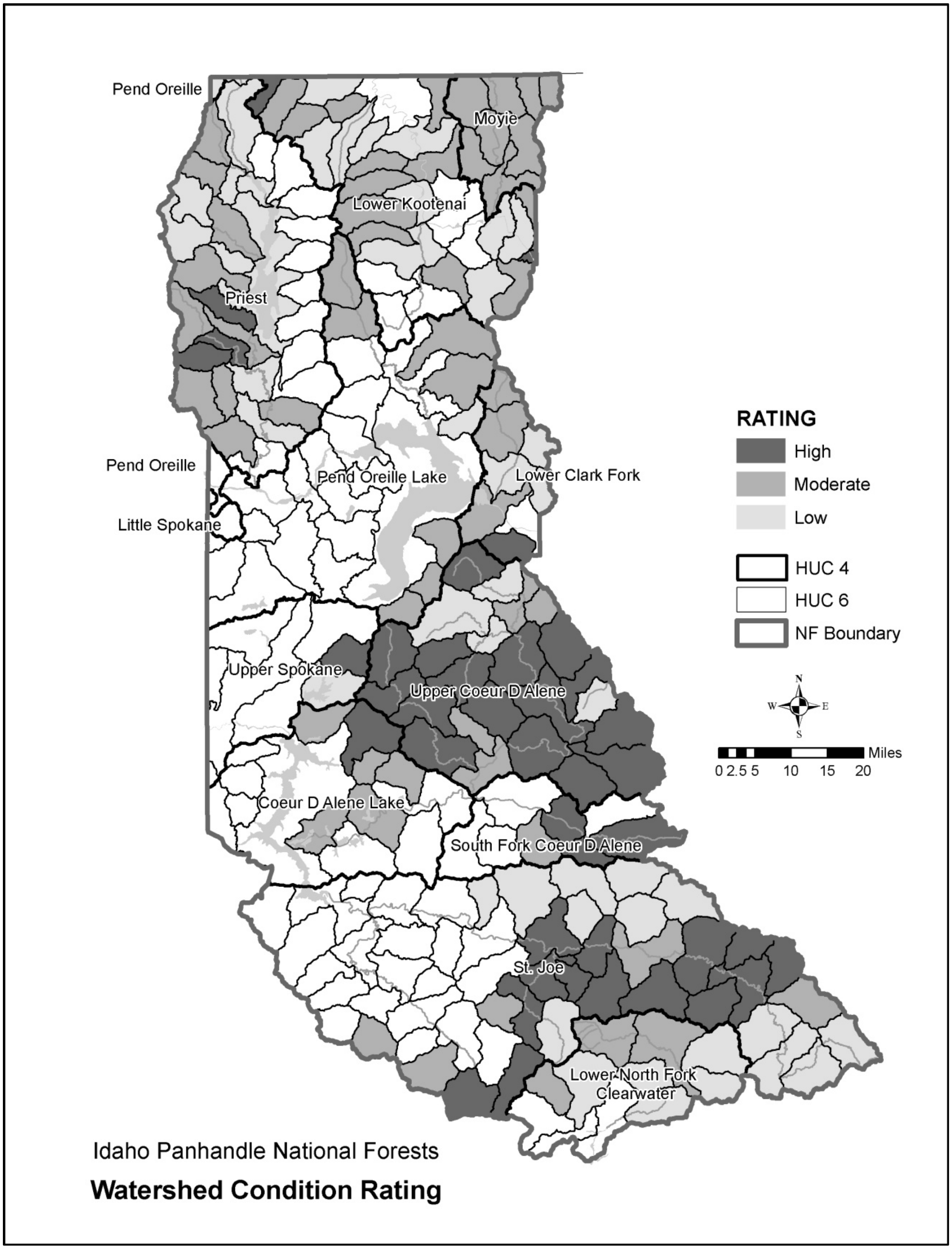


Figure 21. Final Watershed Condition Rating

Table 28. Final Watershed Condition Rating Forestwide

Rating	Number of Subwatersheds (% of Forest)
Low	48 (33%)
Moderate	58 (40%)
High	40 (27%)
Total	**146**

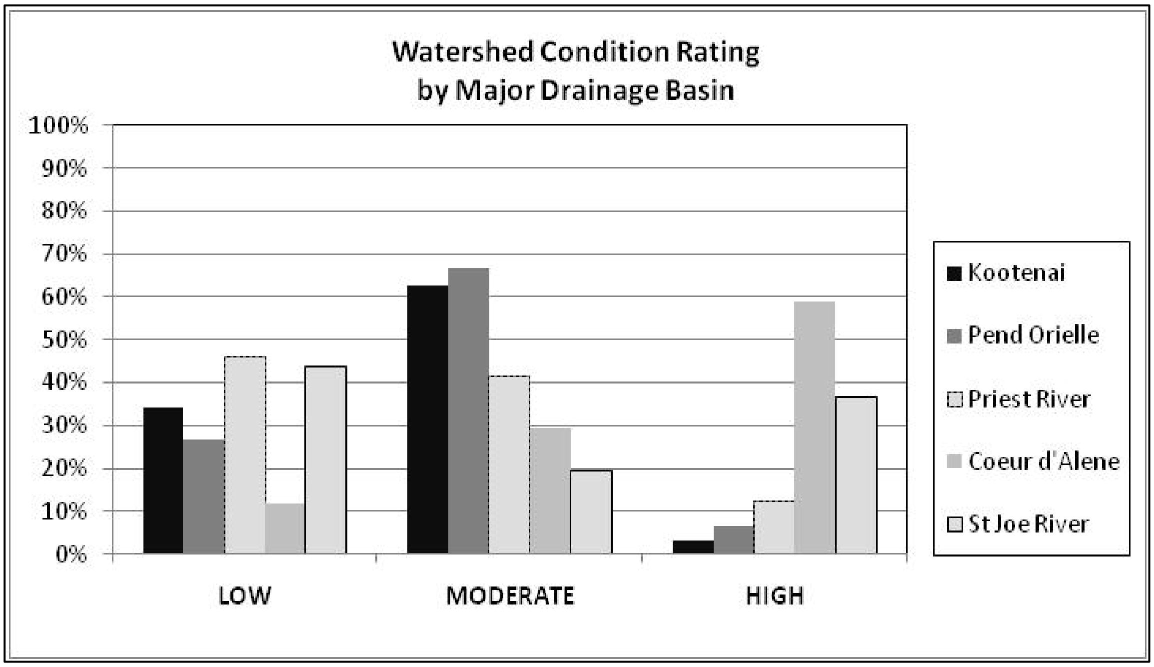


Figure 22. Final Watershed Condition Rating by Major Drainage Basin

Water Quality

Water quality is regulated under the authority of the Clean Water Act, and States assess the waters within their jurisdiction and identify stream segments and other water bodies whose water quality is “impaired” or generally not meeting water quality standards for beneficial uses. Currently, about two-thirds of the subwatersheds associated with the IPNF include or have the potential to influence one or more of these listed segments (2008 Integrated Report (Idaho DEQ 2009)).

Individual stream segments, lakes, and other water bodies have been listed as "Water Quality Limited Segments" (i.e., "impaired") by the states of Idaho, Washington, and Montana. Impaired waters are described in subsection 303(d) of the Clean Water Act as waters that do not meet state water quality standards, a broad term that includes water quality criteria, designated uses, and anti-degradation policies. These segments or water bodies involve 68 percent of the subwatersheds (N=227) on the Forest. The dominant pollutant currently affecting "impaired" water bodies is temperature. Because of new protocol for assessing temperature criteria there has been a dramatic increase in the number of streams listed as impaired from the 1998 list to the 2008 list. The next most common pollutant is sediment. Other pollutants are listed for a small number of subwatersheds.

Subwatersheds with impaired waters are shown in tables 29 and 30. As noted above, the most ubiquitous pollutant is water temperature (thermal modification). Temperature departures are occurring in several watersheds where land management activities that can influence changes to water temperature have not occurred. Water quality limited segments may be included in the same subwatersheds in the following tables; therefore, the total number of watersheds is overstated in some cases. For example, the 10 subwatersheds with cadmium as a pollutant of concern are also the same subwatersheds that account for the pollutants lead and zinc.

Table 29. Number of 303(d)-Listed Subwatersheds and Pollutants of Concern (Forestwide)

Pollutant of Concern	# Subwatersheds (%)
Cadmium	10 (4)
Lead	10 (4)
Zinc	10 (4)
Other Metals	3 (1)
pH	1 (0.5)
Nutrients	1 (0.5)
Pathogens	2 (1)
Sediment	8 (3.5)
Thermal Modification (i.e. Temperature)	108 (46)
Unknown	1 (0.5)

Table 30. 303(d)-Listed Subwatersheds by Major Drainage Basin

Pollutant of Concern	Saint Joe River & Upper Little North Fork Clearwater River	Coeur d'Alene River & Lake	Pend Oreille Lake Basin & Lower Clark Fork in Idaho	Priest River Basin	Kootenai River in Idaho including Moyie River
Cadmium		9			1
Lead		9			1
Zinc		9			1
Other Metals		2	1		
pH					1
Nutrients			1		
Pathogens				2	
Sediment	1	5	2		
Temperature	17	29	13	23	26
Unknown					

Soils

Volcanic ash from eruptions along the Pacific Northwest Cascade Range has significantly influenced forest soils on the IPNF. Volcanic ash soils have lower bulk density, higher porosity, and higher water infiltration and retention than soils unaffected by ash. The capability to hold ample available moisture is thought to enhance site productivity. Unfortunately, ash-capped soils are also very susceptible to negative impacts from machine traffic and, when compacted, the soils may not readily recover over many years.

Presently, soil disturbance in forested ecosystems most commonly occurs from ground-based harvest and site preparation (mechanical and fire), but can also be associated with roads, grazing, and recreation. The effects of soil disturbance on soil productivity, soil quality, or site hydrologic function are dependent on the degree, extent, distribution and duration of the impacts (Clayton et al. 1987, Craigg and Howes 2007, Snider and Miller 1985) and, for projects, are site-specific rather than watershed based. Many forest soils have shown to be resilient to disturbances, while others are at risk of losing the productive capacity because of limitations in the inherent soil properties (i.e., shallow forest floor or thin mineral mantles over bedrock (Burger and Kelting 1999)).

Detrimental effects on soils are not permanent with regards to vegetation re-growth and depend primarily on soil texture, parent material, aspect, and the level of disturbance. Recovery time is typically between 30 to 70 years as second growth timber becomes established around "disturbed areas" (Dykstra and Curran 2002, Froehlich and McNabb 1983, Froehlich et al. 1985). However, soil displacement that mixes or moves the volcanic ash surface layer and reduces moisture holding capacity and productivity may continue to be impacted far beyond the 70 year timeframe.

Soil sampling procedures follow guidelines from the Forest Service Soil Disturbance Monitoring Protocol (Page-Dumroese et al. 2009) for site-specific analysis of management induced soil disturbance in an activity area. Soil sampling transect points fall into one of three categories: 1) no disturbance; 2) disturbance present but not detrimental; and 3) detrimental soil disturbance. The detrimental disturbance category is considered detrimental as defined in FSM 2550 and Region 1 Supplement 2500-99-1.

As a result, detrimental soil disturbance is the proportion of an activity area that may be subjected to displacement, compaction, rutting, erosion, or severe burning due to a particular management activity (such as harvest or fuels treatment), exclusive of dedicated resources (such as system roads). Under the guidance of the 2011 Soil Quality Monitoring Protocol/Technical Guide, soil concerns now include both timber management related temporary roads and landings outside of activity areas. Such data was not included in the soil sampling protocol under the original requirements of FSM 2550.

Intensive mechanized harvest prior to the early 1980s was widespread on private and Forest Service land and resulted in wide-ranging soil quality concerns (Kuennen 2005, Niehoff 2002). Between the early 1950s and early 1980s extensive unconstrained tractor skidding, dozer piling, windrowing, hot burning of slash and burn piles and associated soil disturbance was wide-spread. During this time period, riparian harvest was still the norm and dozer piles were often up to 20 feet high with dozer piling-pushing covering between 80 to 90 percent of the ground in a sale unit. In the early 1980s, dozer piling was replaced with excavator skid lines (trails) running over slash material which resulted in considerably less soil disturbance. Some controls had been imposed but compaction and displacement were still widespread between the early 1980s and early 1990s.

However, soil monitoring over the past decade has indicated that the extent of detrimental disturbance has declined over time as newer harvest equipment and procedures have been put into play (L. Kuennen, personal communication, 2008, Kuennen 2005, Niehoff 2002). As the IPNF moved away from dozer piling towards excavator piling and skyline yarding in the early 1980s, the amount of detrimental disturbance, especially compaction and displacement, was greatly reduced. Early data showed that approximately half of the sites did not meet R1 soil quality standards. This quickly changed to disturbance values on post-harvest sites being less than 15 percent and often even less than 5 percent.

There have also been additional reasons for improvement, such as more careful layout of harvest units and skid trail spacing, seasonal restrictions, fewer visits to harvest units, and an overall awareness of the importance of protecting long-term soil quality.

To display overall trends, data from past soil monitoring was compiled and includes results from 2004 to 2009 for pre-harvest conditions and from 1987 to 2008 for post-harvest observations. Table 31 provides a summary of disturbance ranges for existing soil conditions. Results show that only 4 percent of planned management activities propose to re-enter units that currently exceed regional soil quality standards, which, as identified in R1 Supplement 2500-99-1, are those with more than 15 percent detrimental disturbance.

Table 31. Summary of Disturbance Ranges for Existing Soil Conditions in Units Monitored from 2004 to 2008

Range of Detrimental Soil Disturbance	# of Units	% of Total
0 – 5	272	74
6 – 10	54	15
11 – 15	28	8
>15	13	4
Total	**367**	**100%**

Many affected soils are recovering as shown by observations from field visits and monitoring of units that were harvested from as early as the 1930s. In general, main skid trails and landings often remain in some disturbed condition while many of the side skids and other disturbances are improving to levels that show minimal impacts.

Post-harvest monitoring results are displayed by decade in table 32 and contribute to the estimated range of detrimental soil disturbance. Monitoring has primarily included units that were logged with various types of ground-based equipment, skyline and cable yarding, as well as some horse logging. More recent methods, such as combinations of feller-bunchers with skyline yarding, are also included. During the 1990s, more skyline units were monitored that, due to their general low impact, lower the overall disturbance averages more than the other decades where the primary focus was on disturbance associated ground-based impacts.

Regional soils standards require that 15 percent detrimental disturbance within an activity area should not be exceeded. Disturbance levels in table 32 reveal that changes in logging practices since the 1990s generally result in disturbance levels below 15 percent after harvest is completed. When compared to post-harvest monitoring during the 1980s, the data supports an upward trend in reduced disturbance levels compared to earlier logging and burning practices.

Table 32. Summary of Disturbance Ranges and Trends for Post-Harvest Soil Conditions Monitored over Three Decades (1987 to 2008)

Range of Disturbance	1980s		1990s*		2000	
	# of Units	%	# of Units	%	# of Units	%
0 - 5	2	6	21	58	27	38
6 - 10	1	3	6	17	14	20
11 - 15	0	0	6	17	20	28
>15	29	91	3	8	10	14
Total	**32**	**100%**	**36**	**100%**	**71**	**100%**

* Included more monitoring of skyline than other years, therefore, greater representation in the lower disturbance ranges.

To approximate current soil conditions, residual impacts from past management-related disturbances on soils were estimated from the timber stand management record system. The timber stand management record system record was queried and results are shown in table 33. For areas that were treated or harvested more than once, the most likely impacting logging system was selected (i.e., tractor has a greater impact potential than helicopter) to reflect the acres of affected land.

Table 33. Estimated Past Management and Impacted Soil Acres on the IPNF based on Timber Stand Management Record System and the Soil Disturbance Model

Equipment Class	Estimated Past Management Acres	Disturbance Coefficient	Estimated Impacted Acres*
Tractor	281,253	13 % and 25%	53,438
Site Preparation	15,231	8% and 13%	1,599
Horse Logging	40,079	2%	802
Cable Yarding	71,888	6%	4,313
Skyline	36,762	2%	735
Helicopter	21,815	2%	436
Total	**467,028**	**13%**	**61,323**

* Detailed spreadsheet results are available in the project file.

The resulting acres were entered into a soil disturbance spreadsheet model to estimate detrimental disturbance acres and percentages. The following assumptions were made:

- Tractor logging acres are split in half which represents logging before and after 1990 (13 to 25 percent respectively);
- It is assumed that more than half of the tractor acres displayed in table 33 were logged prior to 1990 and that impacts around 25 percent would prevail; however, the spreadsheet model does not account for recovery over time. Based on field monitoring, most activities that occurred before 1990 have undergone some level of recovery and using professional judgment and local ground based knowledge, the specialist determined an equal split gives a representative estimate; and
- Site Preparation impacts were estimated from 8 percent to 13 percent.

Riparian

Riparian ecosystem areas represent some of the most dynamic and ecologically diverse areas across the landscape. Most riparian areas are obvious because of abundant water and unique vegetation and soil characteristics. Ecological drivers such as geology, climate, glaciations, and stream gradient all influence the type, complexity, quantity, and distribution of these ecosystems and there is great variability in the size and complexity of riparian areas across the Forest. Wetlands, such as swamps, bogs, fens, marshes, and wet meadows, are also considered riparian areas. Wetlands occur in sites with seasonally or permanently high water tables, as well as on the margins of ponds and lakes and commonly support characteristic plant or animal communities which require those unique conditions for survival. Although riparian ecosystems cover a relatively small proportion of the Forest, their ecological significance within the landscape exceeds their limited distribution. Riparian ecosystems can be highly responsive to both natural and human disturbances, although they may respond to restoration activities more quickly than other habitats due to the dynamic interaction between, water, vegetation, and soils.

Healthy riparian areas with a typical abundance of trees, shrubs, forbs, and grasses help to slow flood waters and reduce the likelihood of downstream flooding. Riparian areas also help to improve or maintain water quality by filtering runoff, sediment, and nutrients. Water slowed by riparian areas enters the groundwater table where it is released at a later time. Riparian areas also provide for stream shading keeping water temperatures cool for aquatic organisms. Fish also depend on healthy riparian areas for supporting stable channels and habitat, reliable stream flows, clean water, food, and hiding cover. Benefits for terrestrial wildlife include food, cover, and nesting habitat as well as migration corridors to other habitats. Riparian areas are also attractive and inviting to humans because of proximity to water and aesthetic and recreational purposes.

As described in the previous section for watershed resources, riparian disturbance ratings were used in the determination of a final Watershed Condition Rating. These Riparian Disturbance Ratings provide an indicator of the relative level of human impacts to these ecosystems and are calculated using the variables; riparian area road density and percent intact riparian area, as a function of equivalent clearcut acres. Past harvest activities and roads located in riparian areas are evaluated as having some level of equivalent clearcut acres and recovery factors are applied accordingly (see appendix D for a detailed description of analysis). The distribution of riparian disturbance ratings is displayed in figure 23.

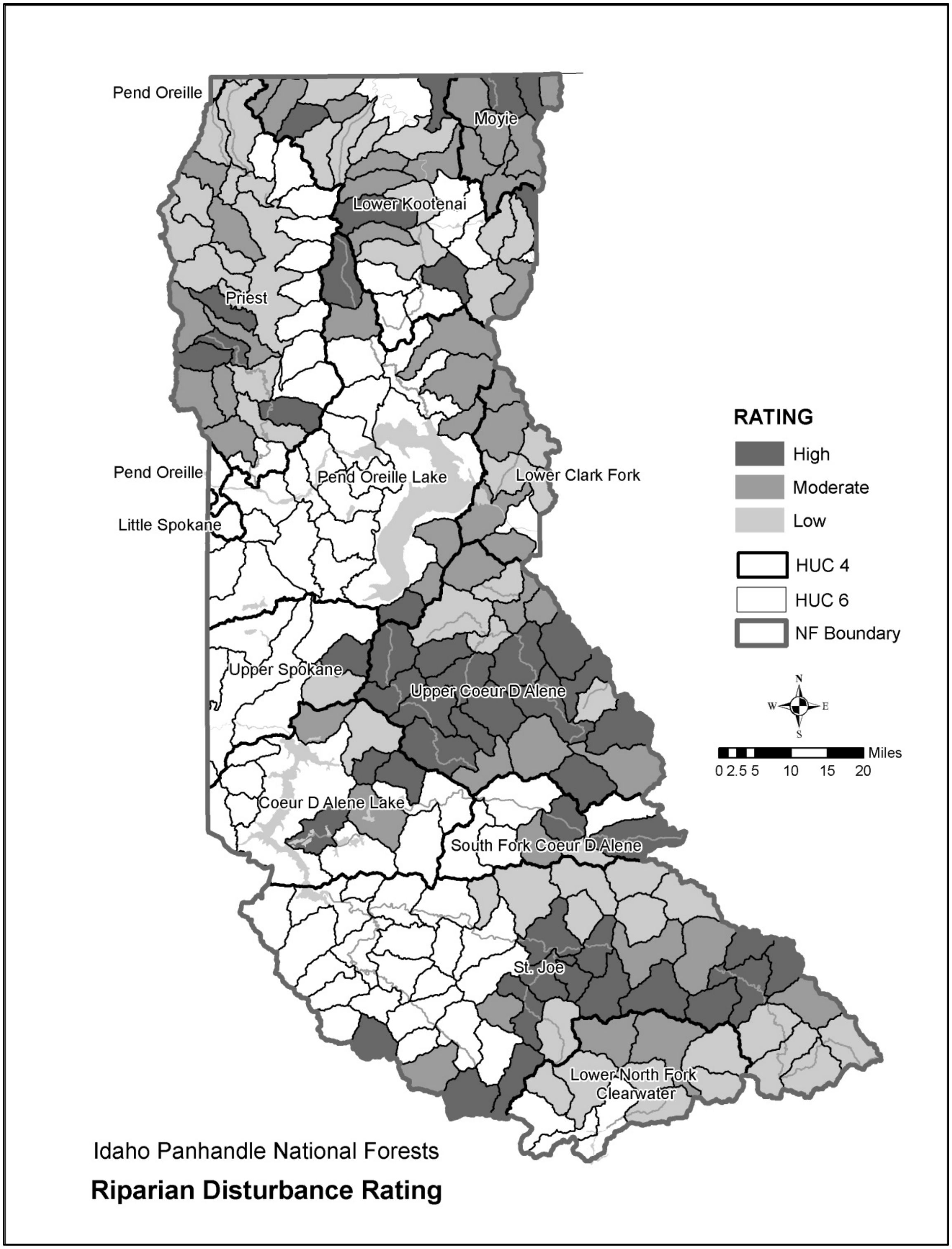


Figure 23. IPNF Riparian Disturbance Rating

The condition of riparian areas can be an indicator of overall ecosystem quality. There are an estimated 700,000 acres of riparian areas across the planning unit, and on average, these areas are considered to be approximately 96 percent intact. In general, many riparian areas on the Forest are believed to be functioning at or near their potential and most degraded areas are in a stable condition or improving. It is estimated that almost 70 percent of all subwatersheds on the Forest have a low to moderate amount of disturbance (table 34), with most of the higher levels of riparian disturbance associated with the central and southern portions of the planning unit (figures 23 and 24). This is likely due to the relatively higher levels of timber management, road construction, and mining activities, compared to other areas on the Forest. Although these areas are relatively functional and there has been improvement in some areas, there are localized areas where riparian areas may be functioning below potential.

Table 34. Riparian Disturbance Ratings, Forestwide

Riparian Disturbance Rating	Number of Subwatersheds (% of Forest)
Low	52 (36%)
Moderate	47 (32%)
High	47 (32%)
Total	**146**

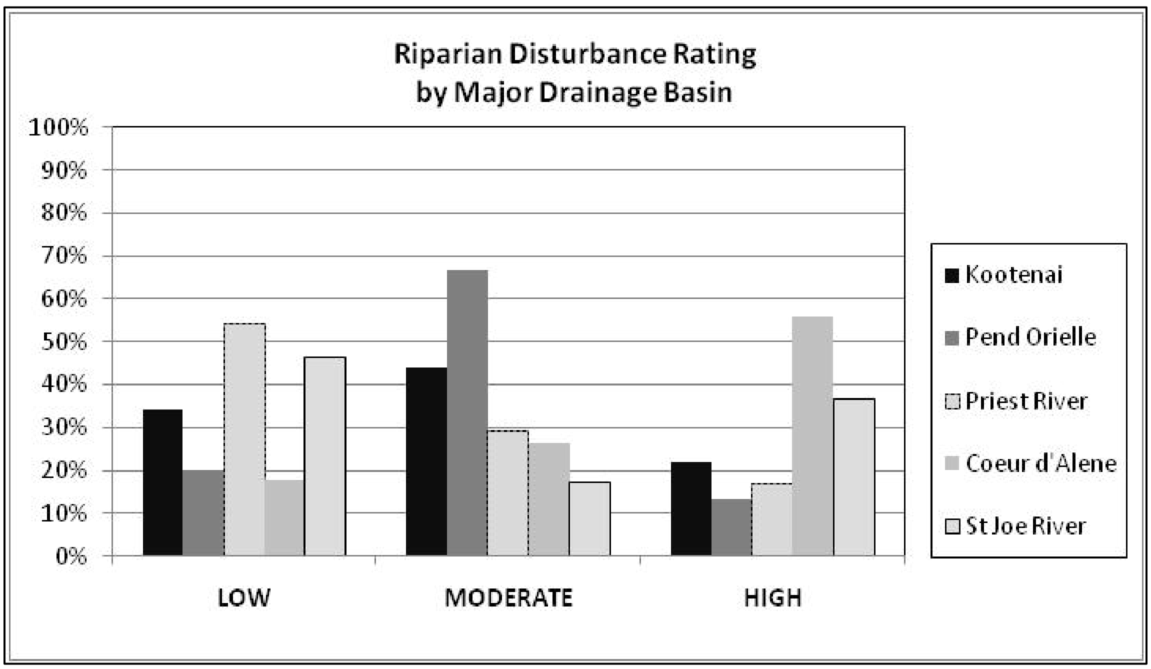


Figure 24. Riparian Disturbance Rating by Major Drainage Basin

Roads can have a relatively high impact on riparian areas and overall road density in a watershed can be an indicator of these effects. It is estimated that there are approximately 3,200 miles of road located in riparian areas, which amounts to approximately 15 percent of all road miles on the planning unit, with an average road density of 2.8 mi/mi2. Another potential indicator of riparian condition and effects to water quality and aquatic habitats is the number of road crossings within a subwatershed. Although all stream crossings are not created equally, higher numbers of stream crossings and density indicate the potential for negative effects to riparian areas, water quality, and aquatic habitats. There are an estimated 15,000 stream crossings across the entire planning unit and an average of 1.8 stream crossings/mi2, for all subwatersheds on the Forest.

Aquatic Habitat/Species

Species distribution and abundance have changed dramatically from historic conditions. Changes in the physical environment and habitat alteration have been among the main contributors to these changes, resulting from historic land management practices and lack of protective measures for aquatic resources. There are indications that historic distribution and abundance shifts continued during the term of the 1987 Forest Plan; however, the rates of change may have been somewhat tempered or even improved with the implementation of protection measures including INFISH amendments and other BMPs. Current conditions and trends show that populations of many native aquatic species are stable or improving (Idaho Fish and Game 2011).

Research indicates a need to identify aquatic habitats that support the most productive, diverse, and otherwise critical populations (Rieman et al. 2000). These habitats provide the best opportunities for ensuring the short-term persistence of aquatic species and provide a nucleus for rehabilitating more complete networks in the future. In these “conservation” watersheds land management activities should focus on the protection and maintenance of high quality aquatic habitats and strong native fish populations, while minimizing the risk to existing values and retaining ecological health. An emphasis on conservation in these subwatersheds does not necessarily mean forest management activities be deferred, but does imply that any activity must clearly minimize or eliminate risks that might compromise the ability of native fish populations to persist (Rieman et al. 2000).

In addition, long-term persistence of aquatic species depends on more than the conservation of existing habitats and populations. Protection of fish habitats and populations alone is not sufficient to maintain biological diversity as these reserves will never be large or well distributed enough (Franklin 1993). Long-term persistence will also depend on restoring watershed processes that create and maintain habitats across stream networks (Rieman et al. 2000) and the use of ecologically compatible land use polices to ensure the long-term productivity of aquatic and riparian ecosystems (Thurow et al. 1997). Site-specific restoration can address or treat specific elements of watershed-scale problems, while larger restoration actions at the subwatershed scale are expected to provide the most benefits for aquatic species, their habitats, and other aquatic dependent resources.

The concept of "priority watersheds" as described in INFISH (USDA Forest Service 1995b) is further refined in the revised Forest Plan as "conservation" and "restoration" watersheds. Priority watersheds in INFISH were designated based on the following criteria:

- Watersheds with excellent habitat or strong assemblages of inland native fish, with a priority on bull trout populations;
- Watersheds that provide for meta-population objectives; and
- Degraded watersheds with a high restoration potential.

INFISH states that priority watersheds are intended to provide a pattern of protection across the landscape, where habitat for inland native fish would receive special attention and treatment. Priority watersheds would have the highest priority for restoration, monitoring, and watershed analysis. Priority areas in good condition would serve as anchors for the potential recovery of depressed stocks, and would also provide colonists for adjacent areas where habitat had been degraded by land management or natural events (USDA Forest Service 1995a). Subwatersheds (6th level HUC) in this condition are considered "conservation" watersheds in the revised Forest Plan. Subwatersheds that are "areas of lower quality habitat, with high potential for restoration, would become future sources of good habitat with the implementation of a comprehensive restoration program (USDA Forest Service 1995b)" are labeled "restoration" watersheds in the revised Forest Plan.

Subwatersheds were identified as “conservation” or “restoration” areas, for an analysis of existing condition, based on a synthesis of the physical condition and status, and that of associated aquatic species status (see appendix D for further description of the process). Conservation subwatersheds are intended to protect stronghold populations of native salmonids and complement restoration efforts. Conservation watersheds were identified using the following considerations: areas with excellent habitat, water quality, and strong populations of native fish species. Restoration subwatersheds were identified by looking for areas with: degraded habitat conditions, water quality limitations, depressed populations of native fish species, a combination of the above, and a relatively higher potential for improvement. There are currently 48 conservation subwatersheds and 96 restoration subwatersheds (56 active and 40 passive) on the Forest (figure 25), as identified by the aquatic conservation strategy and salmonid assessment for the Forest.

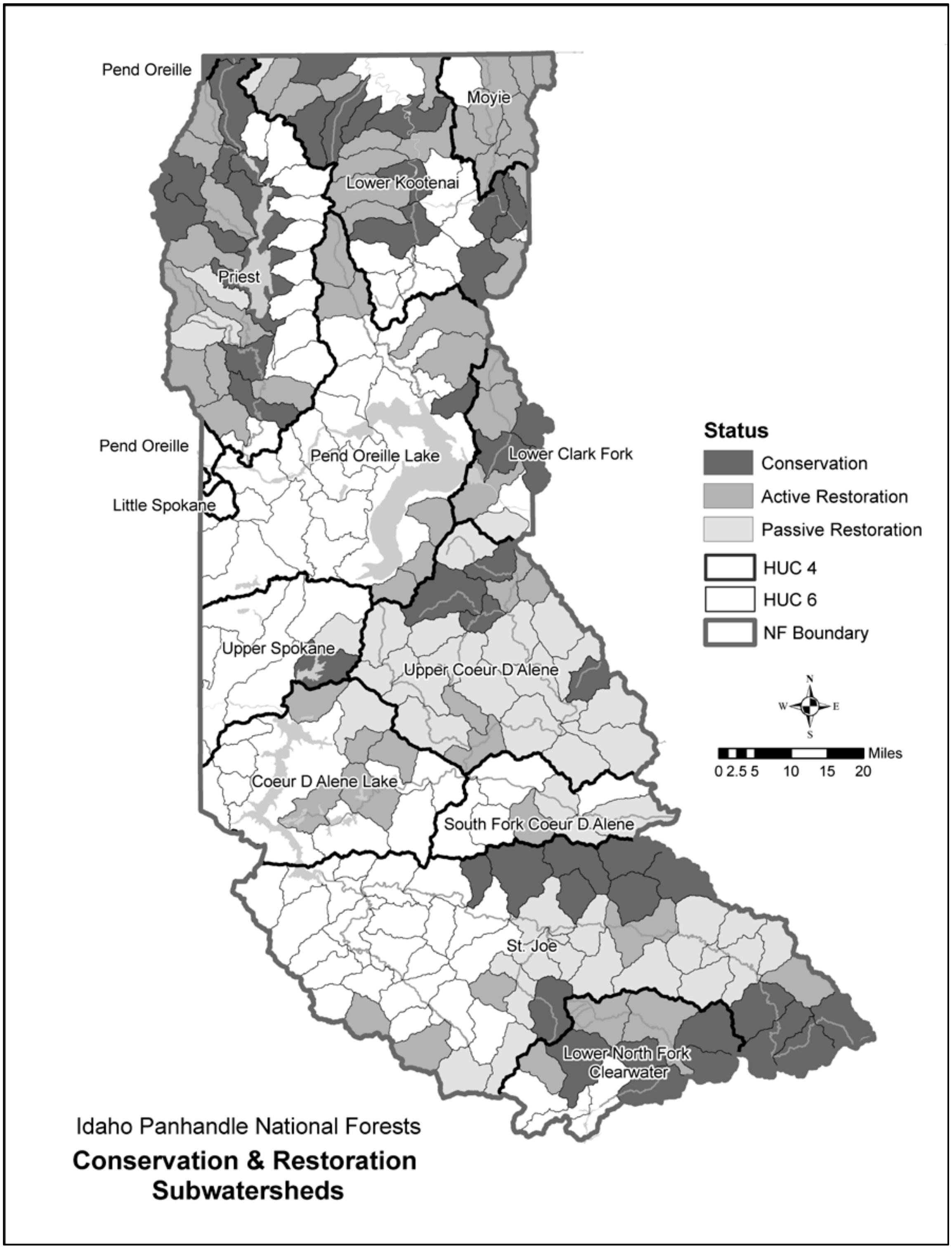


Figure 25. Conservation & Restoration Subwatersheds

Long-term persistence of aquatic species depends on more than the conservation of existing habitats and populations. Protection of fish habitats and populations alone is not sufficient to maintain biological diversity, as these reserves will never be large or well distributed enough (Franklin 1993). Long-term persistence will also depend on restoring watershed processes that create and maintain habitats across stream networks (Rieman et al. 2000) and the use of ecologically compatible land use polices to ensure the long-term productivity of aquatic and riparian ecosystems (Thurow et al. 1997). Site-specific restoration can address or treat specific elements of watershed-scale problems, while larger restoration at the subwatershed scale are expected to provide the most benefits for aquatic species, their habitats, and other aquatic dependent resources. Restoration subwatersheds generally have degraded habitat conditions, but have a high potential for improvement. Restoration activities would be accomplished by identifying and treating risk factors (i.e., unstable roads or poorly located and/or drained roads, certain invasive plants and animals, major obstructions to physical and biological connectivity) which threaten aquatic and riparian ecosystem integrity and are likely to adversely influence achievement of desired conditions.

The following are general statements about the current conditions of some native fish and amphibian species. There are five fish species and two amphibian species listed as threatened or endangered, or on the regional forester's Sensitive Species lists (USDA Forest Service 2011a).

Bull Trout (Salvelinus confluentus) (Threatened)

Bull trout have more specific habitat requirements than most other salmonids. Habitat components that influence bull trout distribution and abundance include water temperature, cover, channel form and stability, substrate for spawning and rearing, and migratory corridors. Bull trout are found in colder streams and require colder water than most other salmonids for incubation, juvenile rearing, and spawning. Spawning and rearing areas are often associated with cold-water springs, groundwater infiltration, and/or the coldest streams in a watershed. Bull trout typically spawn from August to November during periods of decreasing water temperatures. However, migratory bull trout frequently begin spawning migrations as early as April, and have been known to move upstream as far as 155 miles to spawning grounds (Fraley and Shepard 1989).

Throughout their lives, bull trout require complex habitats for cover, including large woody debris, undercut banks, boulders, and pools (USDI Fish and Wildlife Service 2002). Bull trout exhibit three life history types in Idaho: adfluvial, fluvial, and resident. All require cold-water temperatures, typically less than 60° F, during portions of their life cycle to persist. Bull trout are opportunistic feeders with food habits primarily a function of size and life history strategy. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macrozooplankton and small fish (Donald and Alger 1993). Adult migratory bull trout are primarily piscivorous, known to feed on various fish species (Fraley and Shepard 1989).

For spawning and early rearing, bull trout require loose, clean gravel relatively free of fine sediments. Because bull trout have a relatively long incubation and development period within spawning gravel (greater than 200 days), transport of bedload in unstable channels may kill young bull trout. Bull trout use migratory corridors to move from spawning and rearing habitats to foraging and overwintering habitats and back. Different habitats provide bull trout with diverse resources, and migratory corridors allow local populations to connect, which may increase the potential for gene flow and support or refounding of populations.

Maintaining bull trout habitat requires stream channel and flow stability (Rieman and McIntyre 1993). Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover (Sexauer and James 1997). These areas are sensitive to activities that directly or indirectly affect stream channel stability and alter natural flow patterns. For example, altered stream flow in the fall may disrupt bull trout during the spawning period and channel instability may decrease survival of eggs and young juveniles in the gravel during winter through spring (Pratt 1992, Pratt and Huston 1993).

Bull trout in the coterminous United States were listed as threatened on November 1, 1999 (USDI Fish and Wildlife Service 1999a). Earlier rulemakings had listed the Columbia River distinct population segment of bull trout as threatened on June 10, 1998 (USDI Fish and Wildlife Service 1998a). The Columbia River distinct population segment occurs throughout the entire Columbia River basin within the United States and its tributaries, excluding bull trout found in the Jarbidge River, Nevada. The distinct population segment serves as an interim recovery unit in the absence of an approved recovery plan for the species (USDI Fish and Wildlife Service 2008b). Critical habitat was designated for bull trout in 2010 (USDI Fish and Wildlife Service 2010b).

Bull trout occur in the northwestern portion of North America from Nevada to the Yukon Territory (Behnke 2002). Bull trout are native to the streams and rivers within the Columbia River Basin in western Montana and Idaho.

Relatively widespread populations that have declined in overall range and numbers of fish represent the Columbia River bull trout distinct population segment. There have been numerous local extirpations reported throughout the Columbia River basin. In Idaho, for example, bull trout have been extirpated from 119 reaches in 28 streams (USDI Fish and Wildlife Service 2002). A majority of Columbia River bull trout occur in isolated, fragmented habitats that support low numbers of fish and are inaccessible to migratory bull trout. The few remaining bull trout ‘‘strongholds’’ in the Columbia River basin tend to be found in large areas of contiguous habitats in the Snake River basin of central Idaho mountains, upper Clark Fork and Flathead Rivers in Montana, and several streams in the Blue Mountains in WA and OR (USDI Fish and Wildlife Service 1998a).

According to Lee et al. (1997), bull trout are widely distributed across the Columbia River Basin, although their current range is about 60 percent of historic distribution. Although many populations of native aquatic species are stable or improving, bull trout are considered to be in decline across their range. Watersheds that are predicted to be strong spawning and rearing areas represent less than 10 percent of the historic range. Migratory life histories have been lost or are limited throughout the current range due to the introduction of non-native species, intensive land management activities such as road construction, and timber harvest that have affected habitat conditions for the species (USDI Fish and Wildlife Service 1998a).

Bull trout populations on the Forest are included in the Columbia River distinct population segment and their distribution and status are displayed in figure 27. High and others assessment of distribution, abundance, and population trend in Idaho suggested bull trout were obviously reduced from historical levels, but were presently widely distributed, relatively abundant, and apparently stable across the state of Idaho (High et al 2008). The authors found bull trout abundance declined in several areas from the 1980s to the mid-1990s, were relatively stable in other areas, and occasionally increased in some areas from 1994 to 2005.

The draft Recovery Plan for the Columbia River Distinct Population Segment identified a bull trout core area as the closest approximation of a biologically functioning unit for bull trout. By definition, a core area includes a combination of core habitat (i.e., habitat that could supply all elements for the long-term security of bull trout) and a core population constitutes the basic unit on which to gauge recovery (USDI Fish and Wildlife Service 2002). A core population is a group of one or more local populations that exist within core habitat.

Core areas require both habitat and bull trout to function, and the number and characteristics of local populations inhabiting a core area provide a relative indication of the core areas likelihood to persist (USDI Fish and Wildlife Service 2008b). A core area is a system of watersheds within a larger basin. Each watershed is the habitat for a local population that interacts with other local populations throughout the larger basin. Local populations within a core area have the potential to interact because of connected aquatic habitat. A local population is defined as a group of bull trout that spawn within a particular stream or portion of a stream system. A local population is considered the smallest group of fish that is known to represent an interacting reproductive unit. In most areas, a local population is represented by a single headwater tributary or complex of headwater tributaries where spawning occurs. Gene flow may occur between local populations (i.e., those within a core population), but is assumed to be infrequent compared with that among individuals within a local population.

The 2002 draft Recovery Plan describes 121 bull trout core areas across the species' range in five states (USDI Fish and Wildlife Service 2002) and the action area has lands within five core areas: Kootenai River, Lake Pend Oreille/Lower Clark Fork, Priest Lakes, Coeur d'Alene Lake, and North Fork Clearwater River. Current long-term trends show that for some core areas, bull trout are increasing (Lake Pend Oreille, Coeur d'Alene River, and North Fork Clearwater River) and some decreasing (Kootenai River and Priest Lakes) (IDFG 2011).

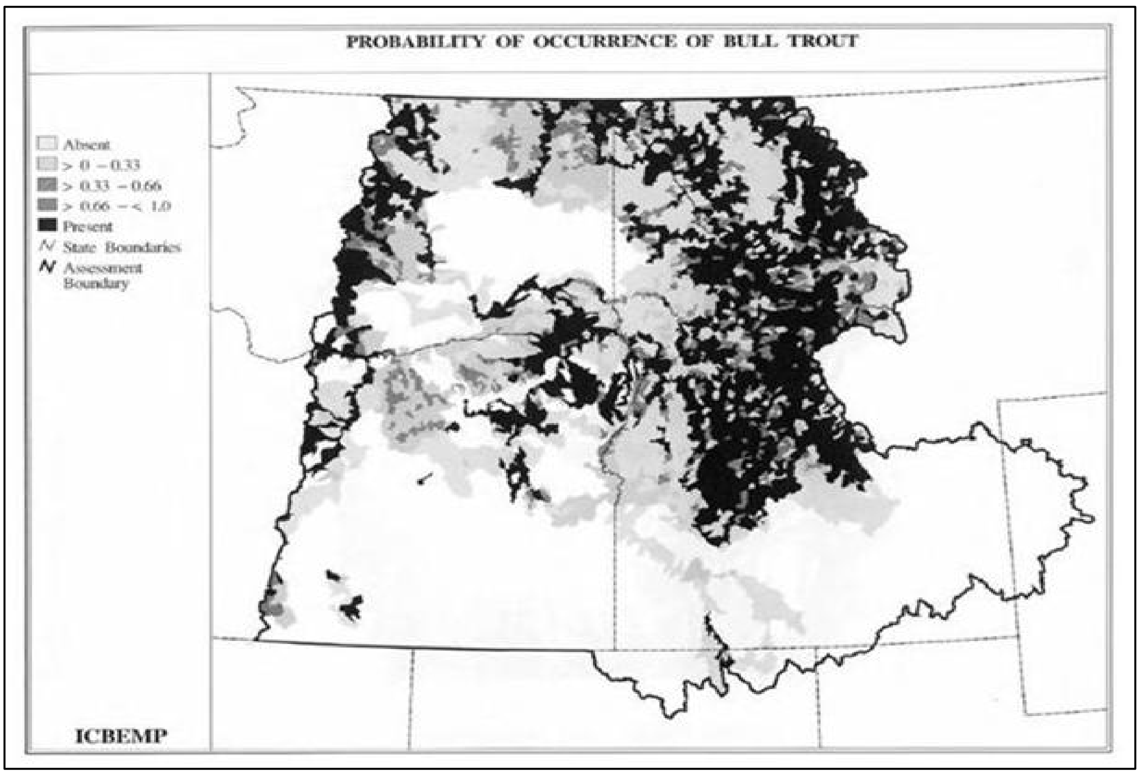


Figure 26. Probable Bull Trout Historic Range (from Lee et al. 1997)

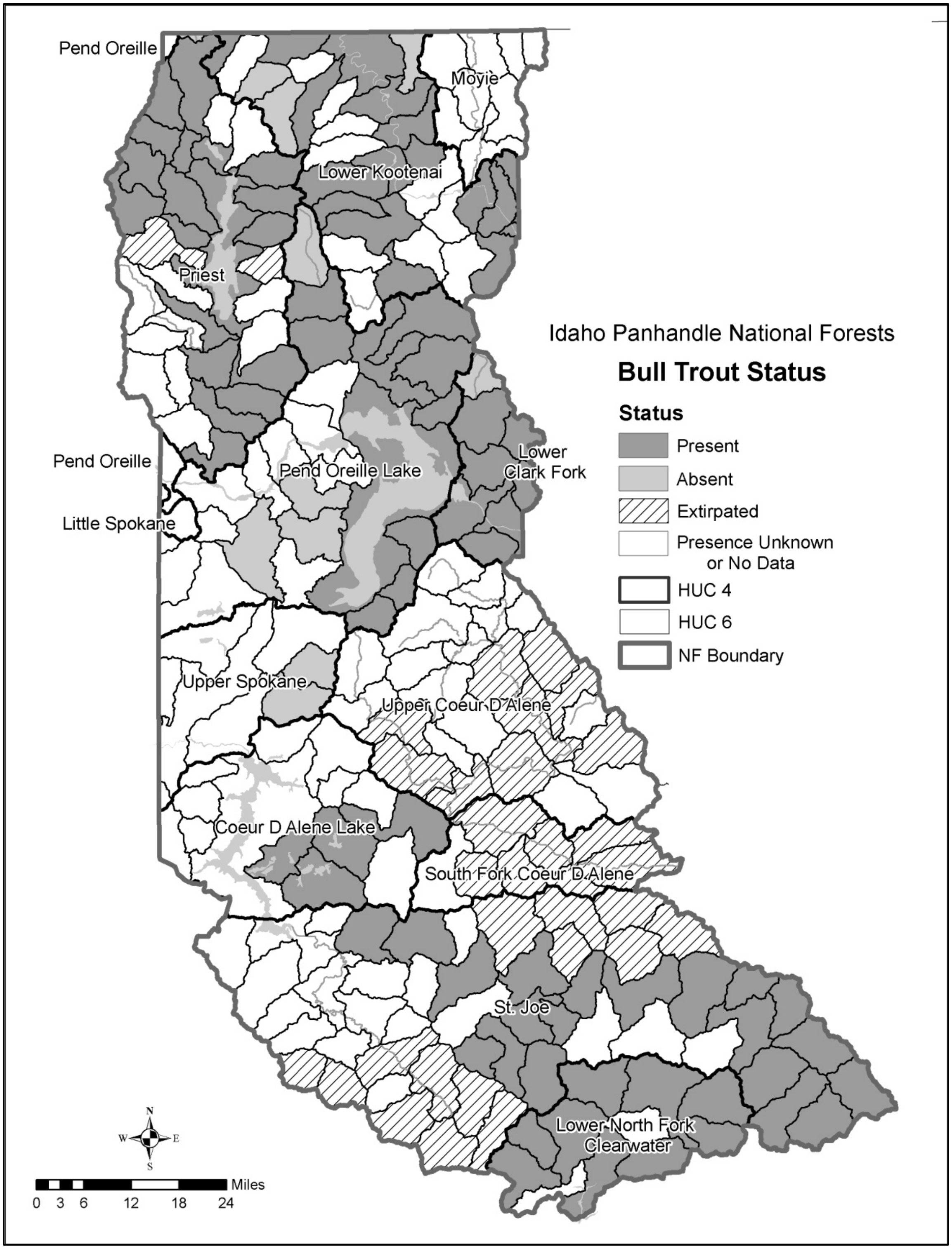


Figure 27. Currently known Bull Trout Distribution

Westslope Cutthroat Trout (Oncorhynchus clarkii lewisi) (*Sensitive*)

Westslope cutthroat trout live in small mountain streams, main rivers, and large natural lakes. They require well-oxygenated water, clean, well-sorted gravels with minimal fine sediments for successful spawning, temperatures less than 70° F, and a complexity of instream habitat structure such as large woody debris and overhanging banks for cover.

Westslope cutthroat trout spawn in small tributary streams on clean gravel substrate, where mean water depth is 17 to 20 cm and mean water velocity is 0.3 to 0.4 m/sec, and they tend to spawn in natal streams (McIntyre and Rieman 1995). Adfluvial populations live in large lakes in the upper Columbia drainage and spawn in lake tributaries. Fluvial populations live and grow in rivers and spawn in tributaries. Resident populations complete the entire life history in tributaries. All three life-history forms may occur in a single basin (McIntyre and Rieman 1995). Migrants may spawn in the lower reaches of the same streams used by resident fishes. Maturing adfluvial fishes move into the vicinity of tributaries in fall and winter and remain there until they begin to migrate upstream in spring. Of migratory spawners, some remain in tributaries during summer months but most return to the main river or lake soon after spawning (Behnke 1992).

Adults prefer large pools and slow velocity areas, stream reaches with numerous pools, and some form of cover generally has the highest adult fish densities. Juveniles of migratory populations may spend 1 to 4 years in their natal streams, and then move (usually in spring or early summer, and/or in fall in some systems) to a main river or lake where they remain until they spawn (McIntyre and Rieman 1995, Spahr et al. 1991). Many fry disperse downstream after emergence (McIntyre and Rieman 1995). Juveniles tend to overwinter in interstitial spaces in the substrate. Larger individuals congregate in pools in winter.

In cold, higher elevation streams, growth rates are slower than warmer streams, with some fish living up to 12 years but only attaining lengths of 7 to 8 inches. Adfluvial and stocks in warmer waters reach lengths of 12 to 15 inches. Westslope cutthroat trout spawn between March and July when water temperatures are about 50° F. Maturity also depends on location ranging from 4 to 6 years and sizes of 4 to 14 inches. Diets are primarily aquatic invertebrates; although larger fish, at times, will habitually or mainly feed on other fish.

Westslope cutthroat trout occur along both sides of the Continental Divide from Yellowstone National Park into British Columbia and Alberta, additionally there are several disjunct populations in Oregon, Washington, and British Columbia (Behnke 2002). Westslope cutthroat trout occur on the IPNF as displayed in figure 28.

This subspecies was petitioned for listing under ESA, although listing was determined to be "not warranted," by the U. S. Fish and Wildlife Service. Current westslope cutthroat trout distribution on the Forest is shown in figure 29. Westslope cutthroat trout are still widely distributed but remaining populations may be seriously compromised by habitat loss and genetic introgression (Lee et al. 1997) (see figure 28), although current populations are stable or improving in some cases. This subspecies is estimated to occur in 60 percent of its historic range (Shepard et al. 2005). Migration barriers (dams, irrigation diversions, road-stream crossings) have isolated or eliminated habitat once available to migratory populations. Small, often isolated populations, persist throughout the range. Idaho Fish and Game and Forest Service data indicate an improving trend in populations and the long-term outlook for many of these populations is positive. Westslope cutthroat trout is a state species of special concern in Idaho (S2). This species is also Region 1 Sensitive Species.

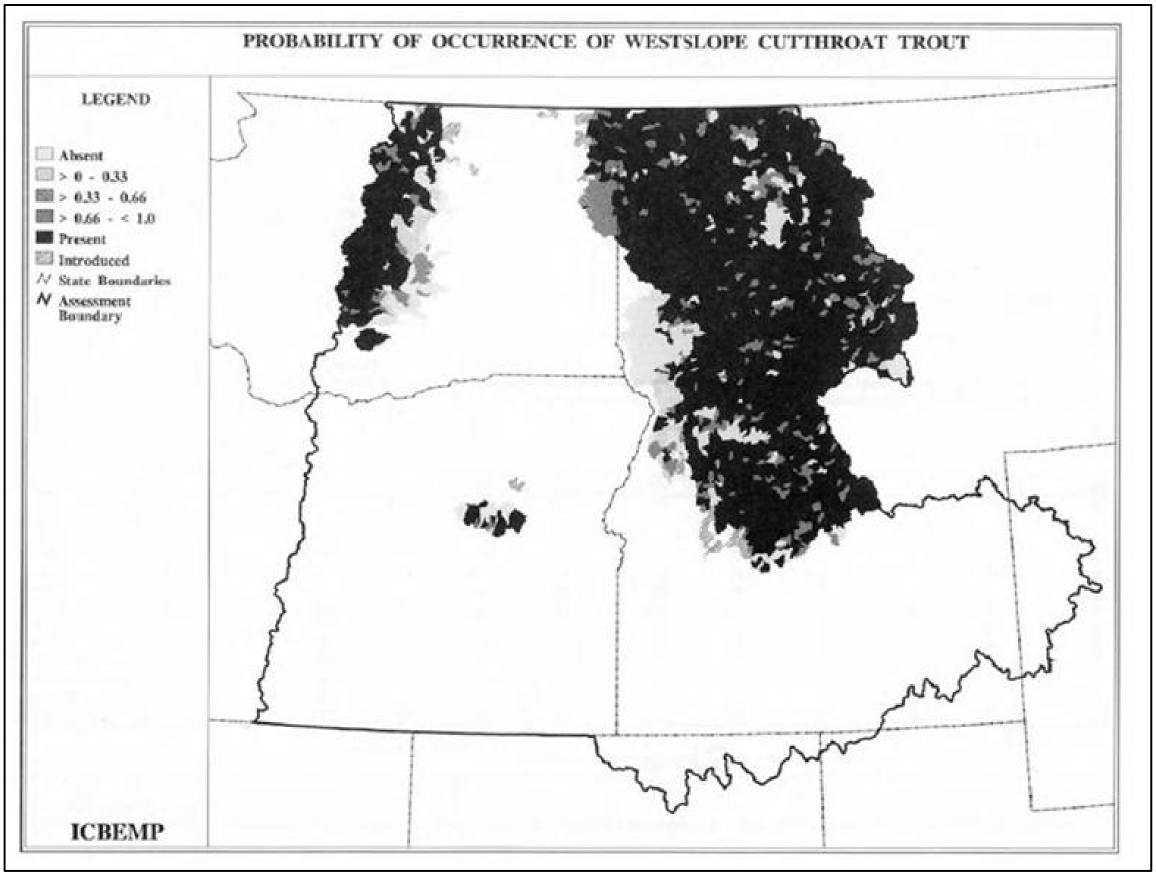


Figure 28. Probable Historic Westslope Cutthroat Trout Distribution (Lee et al. 1997)

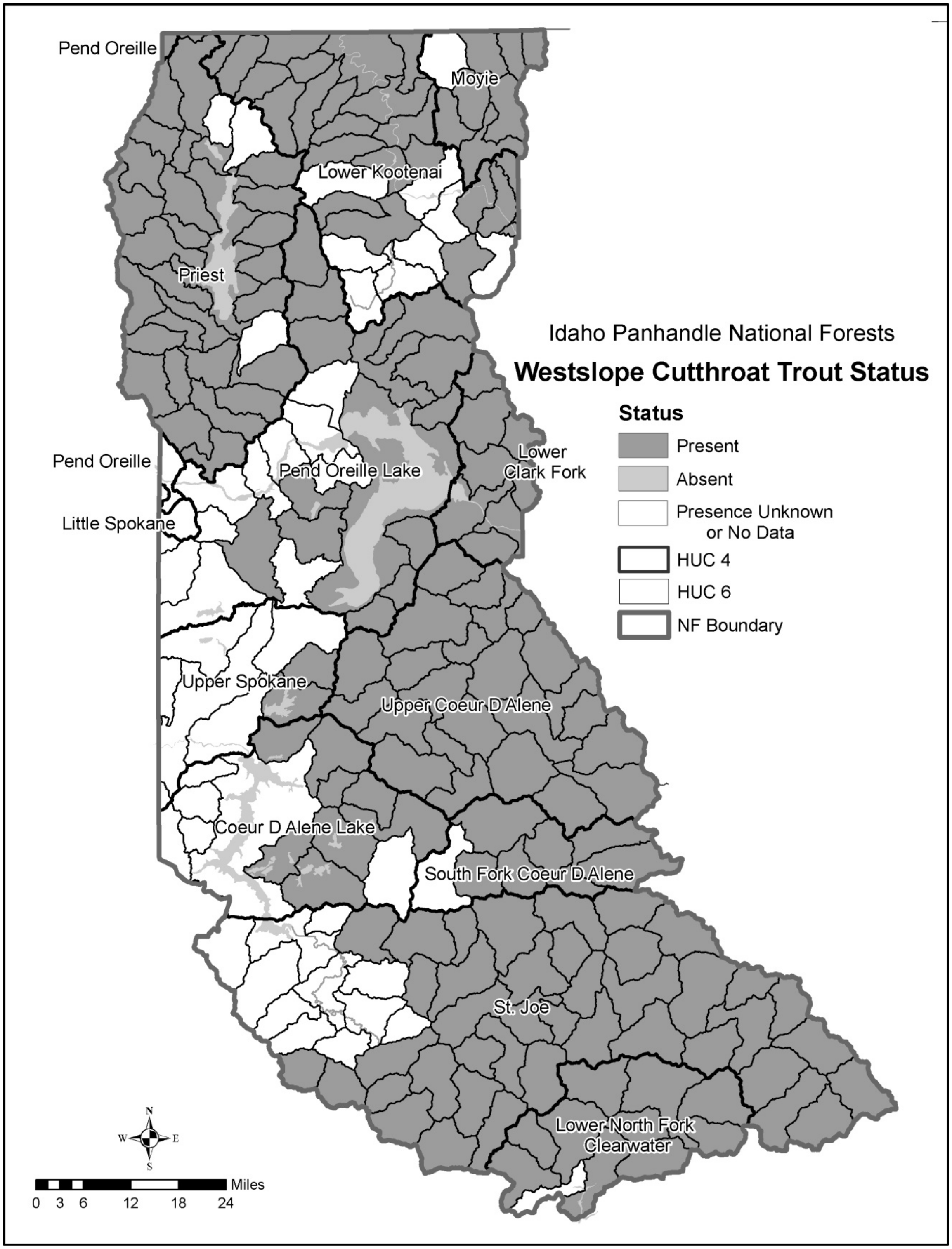


Figure 29. Currently known Westslope Cutthroat Trout Distribution

Interior Redband Trout (Oncorhynchus mykiss gairdneri) (*Sensitive*)

Inland redband trout are found in a range of stream habitats from desert areas in southwestern Idaho to forested mountain streams in central and northern Idaho. In all cases they prefer cool streams with temperatures less than 70° F; however, they can survive daily cyclic temperatures up to 80° F for a short period of time (Wydoski and Whitney 2003). Resident stream redband trout may attain a maximum size ranging from six to eighteen inches depending on location. Spawning occurs in the spring between February and June depending on temperature and location. Diets are primarily drifting invertebrates, both terrestrial and aquatic. Larger fish will occasionally consume other fish.

Inland redband trout are found in the interior Columbia River basin from east of the Cascades upstream to geologic barriers such as Shoshone Falls on the Snake River, Kootenai Falls on the Kootenai River, and in the upper Fraser River (Behnke 2002). However, they are not in the Clark Fork and Coeur d'Alene drainages. This species occurs on the IPNF and its distribution and status are displayed in figure 31.

The allopatric form (i.e., not found in the same areas as steelhead trout) of interior redband trout is found in the Kootenai River and Little North Fork Clearwater drainage. Current interior redband trout distribution on the Forest is shown in figure 31. Distribution of the species throughout the Columbia Basin is shown in figure 30 (Lee et al. 1997). Historically, this species was widely distributed throughout the Columbia River Basin, although it was not widespread on the project area (figure 30). Current populations on the IPNF range from strong to depressed. Hybridization and competition are its main threats. Inland redband trout is a state species of special concern in Idaho (S2/S3) and included on the Region 1 Sensitive Species list (USDA Forest Service 2011a).

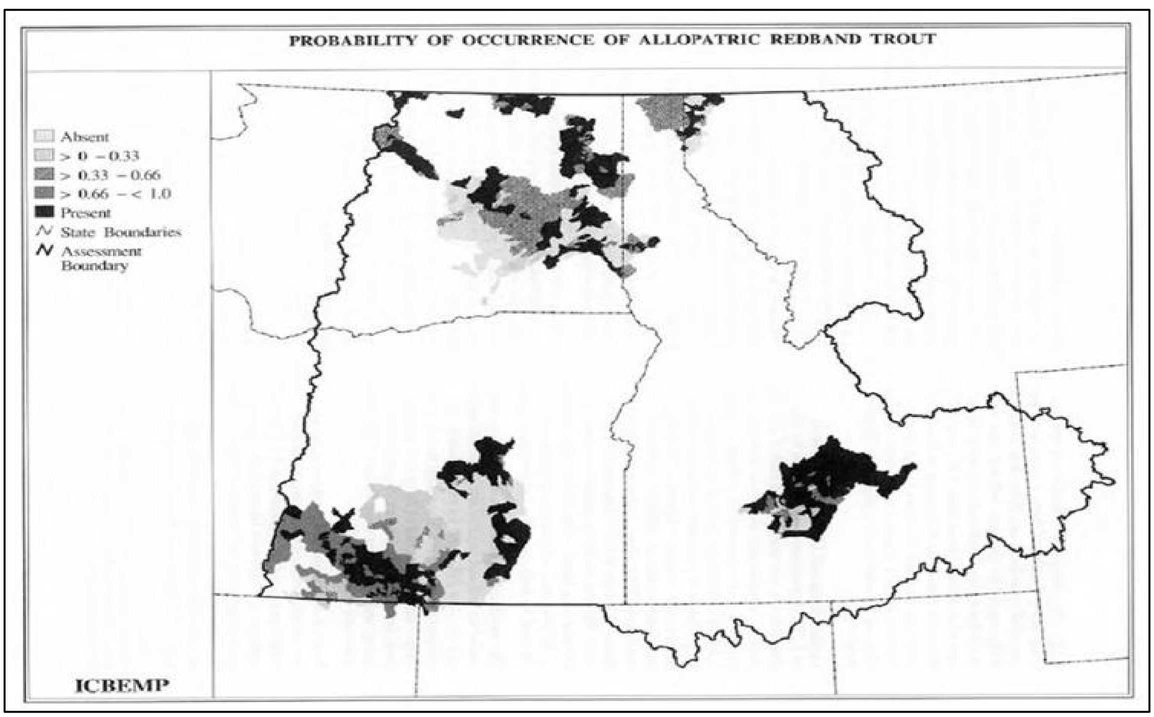


Figure 30. Probable interior redband trout distribution (from Lee et al. 1997)

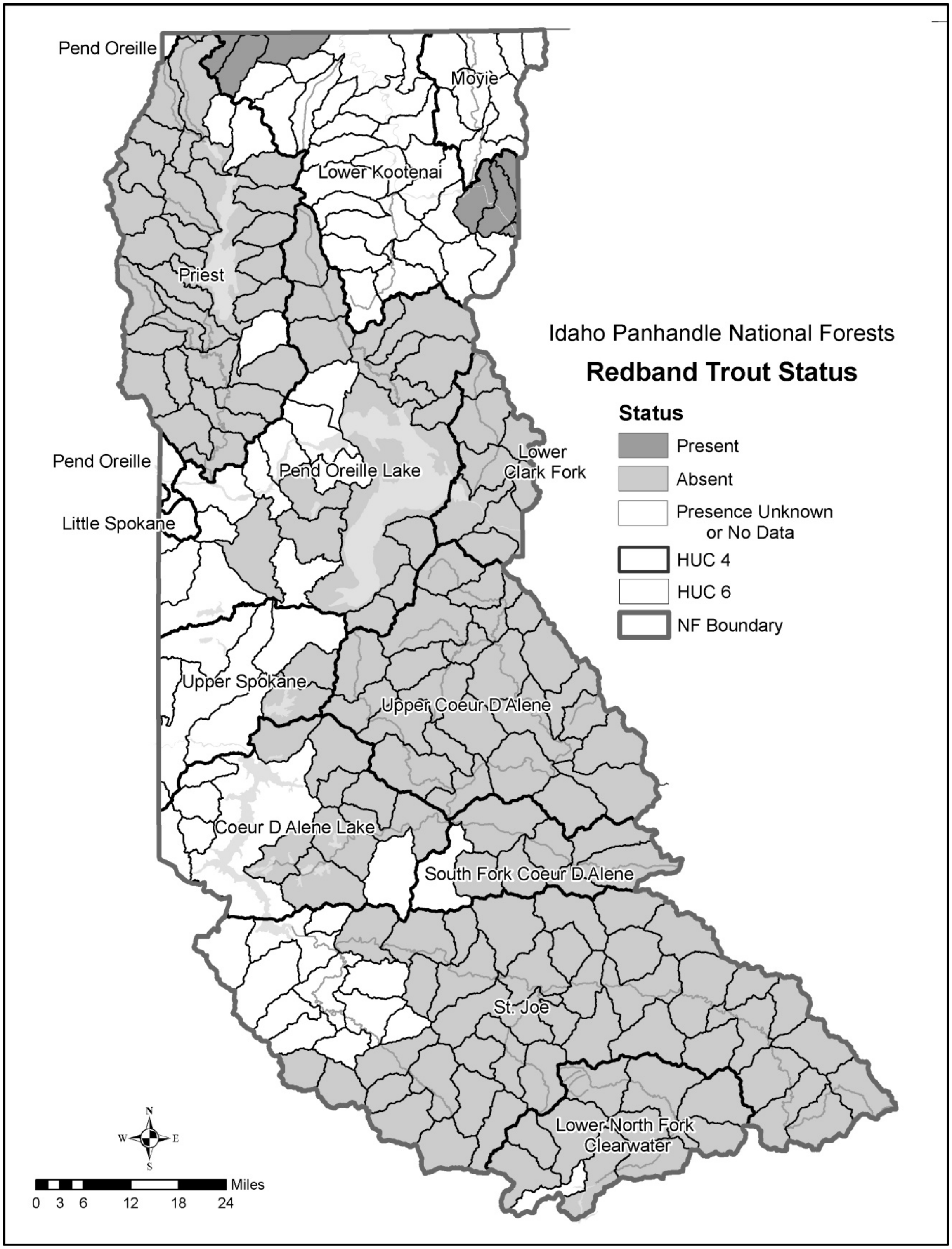


Figure 31. Currently known Interior Redband Trout Distribution

Burbot (Lota lota) (*Sensitive*)

Burbot, also known as ling cod, has been petitioned for listing under ESA. This species is found only in the Kootenai River in Idaho. This population is very depressed from historic levels.

Changes in hydrologic flows caused by Libby Dam are the biggest threat to this population (IDFG 2005). Across their range, they are considered secure, but critically imperiled in the state of Idaho (NatureServe 2011c).

Adult burbot primarily inhabit deep lakes or cool rivers or reservoirs in the southern edges of their range (McPhail and Paragamian 2000). In lakes, burbot are strongly associated with the bottom and prefer temperature range of 10–12° C (50–54° F) and normally remain below the thermocline. Burbot can attain lengths of 99 cm (39 in) and weigh 8 kg (17 lbs) but most are smaller in the 1–3 kg (2–7 lbs) range. Southern populations of burbot mature at 3–4 years of age and females may not spawn each year. Although burbot can spawn in lakes and rivers, the population entering Idaho is primarily a spawning population from Kootenay Lake in British Columbia, which leaves the lake in the late fall and early winter to spawn in the Kootenai River or tributary streams in Idaho. In rivers, burbot spawn in low velocity areas in main channels or in side channels behind deposition bars. The preferred substrate is fine gravel, sand, or silt. Eggs are broadcast above the substrate. The semi–buoyant eggs may drift but eventually settle into the substrate. Spawning is generally high synchronized over a short 2–3 week time period when water temperatures are low (1–3° C [34–39° F]). Burbot primarily feed at night, with fry feeding on zooplankton and small aquatic invertebrates. As they grow, their diet changes to include fish. As adults, more than 80 percent of their diet is likely to be fish.

Burbot have a circumpolar distribution in northern latitudes with wide spread distribution in Canada and northern Asia and Europe. In Idaho, they are only found in the Kootenai River drainage. The current population estimates of burbot entering Idaho in the fall and winter average < 25/year.

Although common in large portions of their range, the Kootenai population has declined significantly in past years. In the 1960s, the winter fishery on the Kootenai River was thought to have exceeded thousands of pounds of fish in both the commercial and sport harvest. In 1994, Idaho Department of Fish & Game only caught eight fish for an average of one fish per 111 net days (Paragamian et al. 2000).

Kootenai River White Sturgeon (Acipenser transmontanus) (*Endangered*)

Kootenai River white sturgeon requires rocky substrates, composed of boulders and cobbles, and high water velocities (3-9 ft/sec) for spawning. These appear to be the two most critical spawning elements (USDI Fish and Wildlife Service 2008c). White sturgeon spawn during spring peak flows when velocities are high and turbidity is elevated. The fertilized eggs sink to the bottom, and then hatch within a few weeks. The newly hatched sac-fry briefly drift with the current before retreating into the substrate for up to a month. The juveniles eventually emerge from the substrate and begin a free-roaming life. Juvenile fish use a wide range of depths and water velocities as habitat.

Outside of spawning migration movements, Kootenai River white sturgeon are relatively sedentary in the deepest locations of the Kootenai River drainage, often selecting low velocity waters greater than twenty feet deep. A study by Young and Scarnecchia (2005) found a high percentage of telemetry contacts associated with the outside bend and thalweg, indicating juvenile fish actively seek deep waters.

Kootenai River white sturgeon is typically found over sand substrates. There are very few areas within the lower Kootenai River that contain substrates larger than sand. Due to the dominance of this small diameter substrate it is not known whether these fish are selecting the area for sand or are forced to use it. Young and Scarnecchia (2005) collected micro-habitat data, but were unable to determine electivity for macro-habitat, river position, or micro-habitat. The authors surmised juvenile fish were forced to utilize sand substrates due to the consistent and dominantly sandy nature of the river bottom. White sturgeon are opportunistic feeders, and subsist on insects, clams, snails, plant material, and fish (Brown 1971).

The Kootenai River white sturgeon was listed as an endangered species in 1994. Reasons for listing included lack of juvenile recruitment reduced biological productivity, possible poor water quality, and effects of contaminants (USDI Fish and Wildlife Service 1994). The recovery plan for the Kootenai River population of white sturgeon was completed in 1999 (USDI Fish and Wildlife Service 1999a).

The original critical habitat designation included 11.2 miles of river below Bonners Ferry, Idaho. Through an interim rule an additional 6.9 miles of critical habitat were designated on February 8, 2006 (USDI Fish and Wildlife Service 2006). Kootenai River white sturgeon critical habitat was revised on July 9, 2008 with a final rule (USDI Fish and Wildlife Service 2008c) to include a total of 18.3 miles of the Kootenai River within Boundary County, Idaho.

The white sturgeon is an ancient fish species that inhabits large rivers, lakes, and marine environments from southern California to the Cook Inlet of Alaska. It is a migratory species reaching lengths nearly 20 feet, weights of 1,970 pounds, and ages of 100 years or more. The white sturgeon, in the Kootenai River, exhibit both riverine and adfluvial life histories.

The white sturgeon is native to the Kootenai River drainage of Montana, Idaho, and British Columbia (Brown 1971), and has been geographically isolated from the lower Columbia River stocks by Bonnington Falls (i.e., Cora Linn Dam), near Nelson, British Columbia. White sturgeon migrate freely throughout the Kootenai River (Andrusak 1980), but are uncommon upstream of Bonners Ferry, Idaho (Graham 1981, Apperson 1992). There are no published reports of sturgeon using lateral tributaries in Idaho or Montana (Partridge 1983). The majority of adult fish resides in Kootenay Lake, and makes extended migrations of more than 100 km to spawn in a 19 km stretch below Bonners Ferry, Idaho. Some adult fish remain in the river and overwinter in the deep (> 30 m) pools.

The Kootenai River population of white sturgeon is naturally landlocked, genetically distinct and restricted to approximately 270 river kilometers (168 miles) of the Kootenai River between Cora Linn Dam, British Columbia and Kootenai Falls, Montana (USDI Fish and Wildlife Service 1994a). Approximately 16 kilometers (10 miles) of the Kootenai River, above designated critical habitat, is adjacent to IPNF lands. Numerous factors including changes in river flow, diking, and operation of Libby Dam have essentially stopped successful spawning and recruitment by wild fish (Beamesderfer 2010). The Kootenai Tribe of Idaho implemented a conservation aquaculture program and began stocking juvenile sturgeon in 1992. The Kootenai Tribe of Idaho provides nearly all recruitment (KTOI 2007). Historic land management activities conducted by the Forest Service, such as road construction and timber harvest, are not considered a factor in the decline of this species (Lee et al. 1997, USDI Fish and Wildlife Service 1994a).

Beamesderfer et al. (2009) provides a population status update. The updated status report includes data collected through 2007. The revised estimates suggest the adult population of Kootenai River white sturgeon lies between 800 and 1,400 individuals with an annual rate of decline of 4 percent. This is an increase from earlier estimates (Paragamian et al. 2005), which predicted a 2007 population of approximately 400 individuals with a 9 percent annual rate of decline. Based upon the revised information the projected timeframe when the wild population would drop below 50 adult fish is 2030 to 2080.

The Forest contains watersheds that drain into the Kootenai River. In the 1994 Final Listing Rule, the U.S. Fish and Wildlife Service issued a biological opinion stating that the Libby Dam, completed in 1974, is the primary factor affecting the Kootenai River white sturgeon (USDI Fish and Wildlife Service 1994a). There has been an almost complete lack of recruitment of juveniles into the population since 1974, soon after Libby Dam began operation (Partridge 1983, Apperson 1992).

Forest management activities have not been identified as a factor in the decline of Kootenai River white sturgeon (USDI Fish and Wildlife Service 1994) and there are no revised Forest Plan components directed specifically at conservation of the species, or its habitat, other than a desired condition to maintain cooperative relationships with other stakeholders (FW-DC-AQS-06).

The Forest administers a small section (approximately 80 acres) of isolated NFS lands, which includes less than 500 feet of riverbank adjacent to designated critical habitat. It is not reasonably foreseeable that this parcel would receive any active management due to its size and location relative to more consolidated lands. If management were to occur, all protective measures for riparian areas and native fish contained within the revised Forest Plan would apply.

Western Toad (Bufo boreas) (*Sensitive*)

Habitats used by western toads in Idaho are similar to those reported for other regions and range from low-elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes to high-elevation ponds, fens, and tarns at or near tree line. Normally toads remain fairly close to ponds, lakes, reservoirs, and slow-moving rivers and streams during the day, but may range widely at night. Eggs and larvae develop in still, shallow areas of ponds, lakes, or reservoirs or in pools of slow-moving streams, often where there is sparse emergent vegetation. Boreal toads are known to migrate between aquatic breeding and terrestrial non-breeding habitats. Adult and juvenile western toads dig burrows in loose soil, use burrows of small mammals, or occupy shallow shelters under logs or rocks. At least some toads overwinter in terrestrial burrows or cavities, apparently where conditions prevent freezing (MNHP and MFWP 2005).

The total adult population size is unknown but likely exceeds 100,000 (IUCN 2011). Within the last 25 years populations of western toads have undergone crashes in Colorado, Utah, southeast Wyoming, and New Mexico (Corn et al. 1997, Loeffler 1998 in Maxell et al. 2009). Bufo boreas is now listed as endangered by the state of Colorado and considered a candidate species which is warranted but precluded for federal listing by the USFWS in the southern Rocky Mountains. Surveys in the late 1990s revealed that toads were absent from a large number of their historic localities in the northern Rocky Mountains and that although they were still widespread across the landscape they occupied an extremely small proportion of suitable habitat (less than 10 percent in most cases, but usually less than 5 percent) (Reichel and Flath 1995, Reichel 1996, Hendricks and Reichel 1996, Werner and Reichel 1996, Reichel 1997, Maxell et al. 2009). Overall population trend is considered to be decreasing (IUCN 2011).

This species occurs along the Pacific coast of North America from southern Alaska to Baja California, and ranges eastward to the Rocky Mountains of west central Alberta, Montana, Idaho, Wyoming, Utah, Colorado, and (formerly) northern New Mexico (NatureServe 2011b). In

Idaho there are records throughout the state. They are considered fairly common and well distributed throughout their range in Idaho as well as on the Forests.

This species is in widespread decline throughout its range. Incidental breeding occurs on the IPNF. Although historic distribution is largely unknown, this species has occurred at Priest Lake Basin, Priest River below Priest Lake, Cocolalla Creek, Lower Coeur d’Alene River, and Little North Fork of Clearwater River. Past land management activities, (timber harvest and road construction) in and around streams and wetlands, have likely resulted in habitat loss. Because of the species’ specific habitat association and the number of unoccupied historical sites, it is possible that populations have declined or even been extirpated locally. Migration barriers, especially roads, have isolated habitats, probably impacting reproduction and/or winter survival. Mortality at roads may be high near breeding ponds that are near roads with large amounts of vehicle traffic.

The western toad is currently recognized as two subspecies with *Bufo boreas* currently recognized as occurring in Idaho. However, mitochondrial DNA analysis indicates that four main phylogenetic groups exist and each may warrant recognition as separate species (Maxell et al. 2009). Globally, western toads are classified as G4 (apparently secure) and nationally as N4 (apparently secure) in both the U.S. and Canada. Throughout the states in which it occurs its rank varies widely from S1 (at high risk) to S4 (uncommon but not rare and usually widespread). It is not ranked in Idaho. The western toad is a Forest Service Northern Region sensitive species. Western toad ecology, biology, habitat use, status, and conservation are described and summarized in Maxell et al. (2009) and Reichel and Flath (1995).

Coeur d'Alene Salamander (Plethodon idahoensis) (*Sensitive*)

Idaho populations of Coeur d'Alene salamanders are found primarily in talus areas along splash zones of creeks, or with seeps running through (Maxell et al. 2009). Nearby habitats are typically forested (Reichel and Flath 1995). Foraging areas include seepage areas and splash zones with high humidity, high substrate moisture, and relatively high temperatures. Shelter is provided by deep bedrock fractures or in talus habitat (Wilson and Larsen 1988).

This species is an invertivore. When above ground, Coeur d'Alene salamanders feed primarily on insects and other invertebrates including millipedes, mites, spiders, harvestmen, snails, and segmented worms (Wilson and Larsen 1988). They appear to be opportunistic feeders and generally restrict foraging activities to moist spray zones, seeps, or streamside rocks and vegetation, although they may venture beyond these areas during rainy periods. The diet is most similar to other salamanders that occupy semi-aquatic habitats (MNHP 2008).

Overall, the global population trend is unknown. The total number of adults is also unknown but probably exceeds 10,000 (NatureServe 2011a). Population declines or extinctions have not yet been documented in Idaho; however, some populations continue to be vulnerable to highway construction. Most populations occur at elevations and in forest types where timber harvest is a common activity. Population sizes are difficult to measure and no estimates are available (i.e., surveys are generally conducted at night, when salamanders are active (MNHP 2008)).

Globally the Coeur d'Alene salamander is classified as G4 (apparently secure) and nationally as N3 (at moderate risk) in both the U.S. and Canada. It is ranked as S3 in Idaho (NatureServe 2011a). The Coeur d'Alene salamander is a Forest Service Northern Region sensitive species.

This species is endemic to northern Idaho, northwest Montana, northeast Washington, and southern British Columbia. On the IPNF, it has been found within the St. Joe watershed. Past land management activities, such as timber harvest and road construction in and near streams, have likely resulted in some level of habitat loss. Because of the species' specific habitat association, it is possible that populations have declined or even been extirpated locally.

The species maintains a disjunctive distribution in northern Idaho, western Montana, and southeastern BC (Wilson et al. 1997, NatureServe 2011a). The majority of the species range is found on the Kootenai and Idaho Panhandle National Forests. This species is a remnant of a once diverse plethodontid salamander fauna in the central Rocky Mountains that was likely reduced by climatic changes over the last 10 to 14 million years (Tihen and Wake 1981). Most known U.S. sites (87 percent) occur on lands administered by the Forest Service, but this data is biased by the fact that most surveys have been conducted on NFS lands (Ibid). Coeur d'Alene salamander population biology, ecology, habitat description, and relationships identified by research are described in Cassirer et al. 1994, Groves et al. 1996, and Maxell et al. 2009.

Western Pearlshell (Margaritifera falcata) (*Sensitive*)

Western pearlshell occurs in sand, gravel, and even among cobble and boulders in low to moderate gradient streams up to larger rivers. This species prefers stable gravel and pebble substrates in low-gradient trout streams and intermountain rivers. Western pearlshell is found in runs and riffles in stable main-current channel areas. This mussel is intolerant of silt and warm water temperatures (Stagliano et al. 2007).

In large Idaho river system, such as the Salmon and Clearwater River systems, *M. falcata*, attains maximum density and age in river reaches where large boulders structurally stabilize cobbles and interstitial gravels. Boulders tend to prevent significant bed scour during major floods. Boulder-sheltered mussel beds, although rare, may be critical for population recruitment elsewhere within the river, especially after periodic flood scour of less protected mussel habitat. In localized areas, where canyon reaches are aggrading with sand and gravel, *M. falcata* is often replaced by *Gonidea angulata*.

Nearly all mussels require a host or hosts during the parasitic larval portion of their life cycle. Hosts are usually fish species and hosts for *M. falcata* in Idaho and Montana were typically and historically *Oncorhynchus* spp. (e.g., chinook salmon, westslope cutthroat trout, steelhead), but *Salmo* and *Salvelinus* (introduced species) and even *Rhinicthys* and *Catostomus* (dace and suckers) are anticipated to be suitable hosts as well.

In Idaho, the historical range of M. falcata includes sites in the Snake, Coeur d'Alene, Lost, and Salmon River drainages (Frest 1999). Populations are thought to persist in north Idaho in the Coeur d'Alene, St. Joe, and St. Maries Rivers. In central Idaho, populations with good viability occur in the Clearwater, Selway, Lochsa, Pahsimeroi, Lost, Salmon, and Little Salmon rivers and in Hells Canyon. In south Idaho, populations are thought to be extant in the upper tributaries of the Snake River, including the Blackfoot River (Frest 1999).

Western pearlshell is a state species of special concern in Idaho (S3) and also included on the Region 1 Sensitive Species list (USDA Forest Service 2011a).

Macroinvertebrate Assemblage (Management Indicator Species (MIS))

Macroinvertebrates are useful and convenient indicators of the ecological health of a waterbody or river. They are almost always present and are easy to sample and identify. Macroinvertebrates can be used to reveal pollution problems and are ideal bioindicators of water quality for several reasons: they live in the water for all or most of their life; stay in areas suitable for their survival;

easy to collect, differ in their tolerance to amount and types of pollution; relatively easy to identify in a laboratory; often live for more than 1 year; have limited mobility; and are integrators of environmental condition. For example, the macroinvertebrate orders Ephemeroptera (mayflies), Plecoptera (stoneflies), and Tricoptera (caddisflies) are considered the three most pollution intolerant species found in freshwater streams and rivers. Because of this characteristic, a high percentage of these orders collected at a specific site typically indicate good water quality.

The PACFISH/INFISH Biological Opinion Implementation and Effectiveness Monitoring Team (PIBO monitoring crew), established by the Forest Service to evaluate the implementation and effectiveness of that decision, collects and analyzes this type of data annually using accepted and peer reviewed methods. Macroinvertebrates are sampled using the protocol recommended by the Center for Monitoring and Assessment of Freshwater Ecosystems, Utah State University (Hawkins et al. 2003). Samples are analyzed and summarized by the BLM/USU National Aquatic Monitoring Center using 10 metrics (Karr and Chu 1997). One summary attribute was developed by the Center for Monitoring and Assessment of Freshwater Ecosystems in cooperation with the National Aquatic Monitoring Center that provides an index of biological condition for each reach. Specifically, the River Invertebrate Prediction and Classification System describes the similarity of the invertebrate species composition at a reach (observed) to the species composition predicted to occur at a reference site within similar environmental conditions (expected) (Archer et al. 2009).

As of 2010, there have been numerous macroinvertebrate sample locations (both repeated and single samples) across the IPNF, with a sampling period beginning in 1998. An average river invertebrate prediction and classification system score of 0.89 for managed sites indicates relatively high water quality and high quality aquatic habitat, as evidenced by the proportion of water quality indicator species present. A River Invertebrate Prediction and Classification System score below 0.68 is considered to significantly deviate from reference conditions.

Environmental Consequences

Effects of Forestwide Direction

Alternative A – No-action Alternative

Watersheds, Soils, Riparian and Aquatic Habitat/Species

Legacy effects from past timber harvest, mining, and other land management activities continue to affect watershed health and the aquatic ecosystem. As amended by the INFISH (USDA Forest Service 1995a), the 1987 Forest Plan direction had reduced the risk to watersheds, soils, riparian, and aquatic resources from new and ongoing activities. For some resources, the standards and guidelines in the previous Plan contain general direction for repairing past damage, although it is lacking for other resources, such as timber harvest. Under the direction of the 1987 Forest Plan, the intensity and risks associated with new and ongoing land management activities has been greatly reduced as compared to the last several decades. It is anticipated that vegetation treatments associated with timber production, vegetation restoration, and other projects harvesting timber will be lower over the past 20 to 25 years than historic levels.

Under the current Forest Plan, watershed, soil, riparian, and aquatic habitat conditions would continue to improve, as a reflection of the current trend in reductions of timber harvest activities and associated ground disturbance.

Soil conditions should reflect an ongoing reduction in harvest and disturbance levels and should improve in response to implementation of the Plan.

Management for riparian and aquatic habitat and species is based on direction outlined in the INFISH (USDA Forest Service 1995a and b), which was amended to the Forest Plan in 1995, and was designed to provide protection but did not focus on restoration. It primarily provided direction for protection and passive restoration measures.

The PACFISH/INFISH Biological Opinion Implementation and Effectiveness Monitoring Team (PIBO monitoring crew) was established by the Forest Service in order to evaluate the implementation and effectiveness of that decision on 21 Forest Service and seven BLM units within the Columbia River Basin, including the planning unit. Preliminary analysis of the first 3 years of data from repeated site visits across the Upper Columbia River basin suggests that land management strategies implemented for the protection of aquatic habitats may be meeting the intent of the 1998 Biological Opinion for bull trout, salmon, and steelhead. For complete PIBO summary information, visit the Forest Service Fish and Aquatic Ecology website.

Factors that may have contributed to a decrease in riparian area function include: improper livestock grazing, timber harvest, road construction, water diversions, and disturbances associated with recreational use. These types of management activities have altered riparian conditions by changing flow regimes, altering channel morphology, and changing plant communities. Natural disturbance in riparian areas may temporarily degrade conditions, but is also necessary for the regeneration of many native plant species. Riparian ecosystems are tied to the surface and groundwater hydrology, natural sediment supply, and disturbance regime of a particular landscape and many riparian plant species reproduce only after flood disturbances. Appropriate hydrologic and sediment regimes are important for maintaining the integrity of these ecosystems. Changes in the sediment load within stream channels may lead to down cutting or lateral erosion, altering floodplains and water table relationships. Riparian areas can often be key sites for invasion of exotic plant species due to the relatively higher level of human uses in these areas. Loss of native vegetation can disrupt the functioning of riparian areas because of decreases in root densities, which are important for stream channel stability and changes in plant communities.

Another potential indicator of riparian condition and effects to water quality and aquatic habitats is the number of road crossings within a subwatershed. Although all stream crossings are not created equally, higher numbers of stream crossings and density indicate the potential for negative effects to riparian areas, water quality, and aquatic habitats. Current management activities to improve water quality and aquatic habitats have included a reduction of the number crossings or improvement of their condition. It is presumed that this emphasis in stream crossing improvements would continue over the course of the next planning period.

Threatened, Endangered, and Sensitive Species

As protection measures outlined in the 1998 INFISH Biological Opinion continues to be implemented, populations of threatened, endangered, and sensitive species will continue to remain stable or increase in population size and distribution.

Management Indicator Species (MIS)

Under Alternative A, it is anticipated that the level of diversity for the water quality indicator macroinvertebrate assemblage across the planning unit will be at least maintained, at current proportions (River Invertebrate Prediction and Classification System score = 0.81).

Alternatives B Modified, C, and D

INFISH is forestwide direction that has been brought forward through all action alternatives (FW-STD-RIP-03); therefore, the effects from implementation of this strategy described under Alternative A are also common to all of the action alternatives.

Watersheds, Soils, Riparian, and Aquatic Habitats/Species

Forestwide objectives, standards, and guidelines would protect watershed health and aquatic habitats for vegetation management activities. The construction of few new roads is anticipated; and existing roads will be routinely improved, upgraded, or removed as they are evaluated during planning efforts for individual management activities. Any miles of road construction will be greatly offset through miles of road decommissioning. The revised Forest Plan, does not include any objectives specifically for road construction as it relates to soil and aquatic resource protection or restoration; however, the Plan does include an objective for 10 to 15 miles of road decommissioning or placing roads into intermittent storage as an annual average over a 5 year period (FW-OBJ-AR-03).Consequently, watershed conditions are not expected to decline from the current level of management in the Plan and are expected to improve.

Riparian Habitat Conservation Area (RHCAs): INFISH provides for protection from some effects of timber harvest and prescribed fire on riparian and aquatic habitats through the implementation of RHCAs, which buffer streams from non-point source sediment generated by land management activities. Riparian conservation areas are zones typically associated with riparian vegetation and stream channels, for the protection of riparian vegetation, streambank stability, shading characteristics, and aquatic habitat. Riparian conservation areas contribute to maintaining the integrity of aquatic ecosystems by influencing the timing and delivery of sediment, organic matter, and woody debris to streams; providing root strength for channel stability; and providing shade and thermal regulations to streams. Because of the importance of riparian systems to the integrity of aquatic ecosystems that support aquatic habitat, appropriate delineation of RHCAs during project analysis and implementation is critical. Recent studies about the structure and dynamics of riparian zones have extended the scope of understanding about this landscape attribute and have important management implications for streams, riparian areas, and adjacent uplands (Quigley and Arbelbide 1997, Spence et al. 1996). Riparian conservation areas allow specialists to determine the level of analysis that best suits the needs of a project based on potential effects, baseline conditions, management direction, and issues. Riparian conservation areas define the type and levels of management actions that are suitable within or adjacent to RHCAs. Riparian conservation areas establish a network of refugia that promotes the conservation of aquatic species while preserving and restoring riparian function and ecological processes.

Proposed forestwide direction includes specific standards associated with RHCAs, such as FW-STD-RIP-01 and FW-STD-RIP-02 that require specialists to evaluate the function and condition of RHCAs during project level planning. Based on this information, specialists can determine the level of analysis required for riparian areas that best suits the needs of a project. The direction also defines the type and level of management actions that are suitable within or adjacent to RHCAs. The revised direction would ensure that RHCAs provide a network of refugia that promotes the conservation of aquatic species while preserving and restoring riparian function and ecological processes.

Conservation and Restoration Subwatersheds

As described in the "Affected Environment" section of this document, subwatersheds were characterized as having conservation or restoration characteristics as a function of watershed condition ratings and status of native salmonid species. Conservation watersheds contain excellent habitat, water quality, and strong populations of native fish species. Restoration watersheds may have degraded habitat conditions, water quality limitations, depressed populations of native fish species, or a combination of the above, but have a relatively higher potential for improvement.

All the action alternatives include a forestwide desired condition that states "Conservation subwatersheds provide habitats that can support population strongholds of federally listed and sensitive species. Conditions in restoration watersheds improve to support population strongholds" (FW-DC-AQH-03). Based on desired conditions, and language provided for in the definitions of these strategies, conservation and restoration subwatersheds would have a relatively high priority for the protection or restoration of listed fish species and sensitive species, monitoring, future multi-scale analyses, and expansion and re-colonization of aquatic dependent species into habitats in adjacent subwatersheds.

These conservation and restoration areas should provide a level of protection and identify areas that have a relatively higher need for restoration of native species and water quality limited drainages. These areas serve to reduce the risks associated with factors of decline and contribute to the recovery and restoration of aquatic species, their habitats, water quality, and other aquatic resources. Land management in these priority subwatersheds is designed to complement other recovery/restoration plans and build on actions already taking place to recover species and improve the condition of water bodies that do not support designated beneficial uses.

Restoration activities implemented under the revised Forest Plan should be prioritized based on the presence and sensitivity of native fish species and subwatershed functional rating. This restoration prioritization approach formulates the template for recovery and restoration by applying the appropriate restoration approach (active or passive) and prioritization for subwatershed restoration to all subwatersheds within their respective subbasins across the Forest, thereby providing an efficient means to promote restoration activities and recovery of aquatic species and improvements in water quality and aquatic habitats. Watershed restoration is designed to facilitate the recovery of watershed functions and related physical, biological, and chemical processes that promote recovery of riparian and aquatic ecosystem structure and function and benefit native aquatic species. Proposed watershed restoration in the revised Forest Plan includes both passive and active components to achieve aquatic and riparian desired conditions depending on the opportunities provided for in different MAs such as MA1b (recommended wilderness) and MA6 (general forest).

Active restoration is the direct manipulation of ecosystems to re-establish or facilitate the improvement of selected ecosystem processes. It is generally applied through the use of integrated treatments strategically located and implemented at the watershed scale. Active restoration relies on identifying and treating root causes that have contributed to the loss of aquatic ecosystem health. Treatments that address several ecosystem characteristics can influence the desired trajectory of conditions at a subwatershed scale. It may be impossible to achieve former (pre-human disturbance) conditions through restoration; however, it is desirable to restore ecosystem patterns and processes to support native species even if the best that can be achieved is a facsimile of a former condition. Selection of high priority restoration subwatersheds considers the extent of habitat degradation and the degree to which their natural diversity and ecological processes are retained. Active restoration activities consider and complement recovery plans for fish, other riparian dependent species, and water quality. Active restoration opportunities would be more prevalent in designated areas such as MA6 (general forest).

Passive restoration relies on the implementation of guidelines, other sources of design criteria (e.g., Forest Service Manual and Handbook direction), and BMPs to maintain watershed processes and aquatic habitat conditions and allow for natural rates of recovery. Because passive restoration primarily maintains current conditions, active restoration is often needed to move a degraded system toward recovery. Passive restoration opportunities would be more prevalent in MAs such as 1b and 1c that have wilderness characteristics.

To be successful at restoration it is important to have solid linkages to other plans (e.g., Idaho State Wildlife Conservation Plans, Federal Recovery Plans, state water quality plans) and strong working relationships with other land owners and stakeholders. Watershed scale restoration is an interdisciplinary effort and necessitates close coordination between multiple resource programs, watershed councils, adjacent landowners, and other stakeholders and partners. Cooperation with land owners and interested parties such as watershed councils, state agencies, tribes, and conservation districts, can result in large benefits and returns on investments because mutual priorities and opportunities are identified and resources can be pooled to accomplish conservation and restoration actions. Specific direction in the revised Forest Plan that provides for this restoration strategy can be found in FW-DC-AQS-01, 03, and 04.

Active restoration opportunities will be pursued, whenever possible, and considered in the context of existing budget levels and other land management priorities. Revised Forest Plan direction will be applied to these priority areas and merit special consideration of their values during the planning and implementation of project level management actions.

As the revised Forest Plan is implemented, there is an anticipated shift in the amount of active restoration towards conservation condition as habitats improve and restoration components in the Plan move subwatersheds from a rating of “moderate” or “high” towards a rating of “low” and native species move in to those improved habitats.

Watershed, soil, riparian, and aquatic habitat conditions under Alternative B Modified are expected to improve more rapidly than under Alternative A or C, as a reflection of the current trend in reductions of timber harvest activities and associated ground disturbance, as well as proposed direction in the revised Forest Plan. For example, forestwide direction common to all action alternatives are designed to improve watershed condition (FW-OBJ-WTR-01 and 02); protect soil conditions, soil quality, and maintain soil productivity (FW-GDL-SOIL-01, 02, 03, and 04) restore riparian and aquatic habitats (FW-STD-RIP-01, 02, and 03, and FW-OBJ-AQH-01, 02 and 03).

Threatened, Endangered, and Sensitive Species

Alternative B Modified: Due to the protection and restoration measures outlined in the revised Forest Plan, it is anticipated that these species will show a more rapid improvement than under Alternative A or C. As an example, statements FW-DC-AQS-04 and 05 describe desired conditions for bull trout and objective FW-OBJ-AQS-01 seeks to improve the condition of subwatersheds with sensitive, threatened, or endangered aquatic species.

Alternative C: Populations of these species are anticipated to show improvements under Alternative C, but those improvements will be achieved more slowly than other alternatives as a result from more passive restoration opportunities in MA1b.

Alternative D: Populations of these species are anticipated to show improvements under Alternative D, and may be achieved more rapidly than other alternatives as a result from more potential for active restoration opportunities in land allocated to MA6 (general forest).

Management Indicator Species (MIS)

Alternatives B Modified: The macroinvertebrate assemblage, used to indicate the condition of water quality and aquatic habitat conditions across the entire planning unit, is expected to improve. Measures in the revised Forest Plan that emphasize macroinvertebrates include direction such as FW-DC-AQS-01 and FW-OBJ-AQH-02.

Alternative C: Given the passive restoration nature of Alternative C, it is expected that the assemblage diversity will improve, but at a slightly slower rate than Alternative B Modified or D.

Alternative D: Given the active restoration nature of Alternative D, it is expected that the assemblage diversity will improve, but at a more rapid rate than Alternative C.

Effects of Management Area Direction

MA1b: Alternative C proposes more recommended wilderness (MA1b) and in order to retain the wilderness characteristics of those areas there would be an overall improvement to watershed, soil, riparian and aquatic habitat conditions. Although there are anticipated improvements, these benefits would be realized through more passive restoration activities and could actually be more slowly attained than A, B Modified, or D, because of limited opportunities for active restoration.

MA6: Under Alternative D, there could be relatively more improvement in watershed, soil, riparian and aquatic habitats relative to Alternatives A, B Modified, or C. This interpretation is based on the fact that there is more land area allocated to MA6 (general forest) which increases the possibility of more land management activities; it does not preclude as much potential active restoration opportunities associated with those activities as do the other alternatives. In other words, more activities are expected, allowing for more protection and restoration opportunities related to watersheds, soils, riparian and aquatic habitats and species.

Consequences to Watersheds, Soils, Riparian, and Aquatic Resources from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Roads

General Effects

Roads have the potential to affect aquatic ecosystems and aquatic organisms through several direct and indirect pathways and to modify natural drainage patterns which often lead to accelerated erosion of road surfaces and associated cut and fill slopes. This can lead to increased sediment delivery to streams. Excess fine sediment can fill interstitial spaces in gravels and cobbles, which reduces available habitat for aquatic macroinvertebrates. In addition, this fine sediment reduces the quality of spawning gravels for salmonids and can ultimately reduce reproduction. Excess sediment can also reduce the quantity and quality of pool habitats. Roads can affect stream channels directly if they are located on active floodplains or directly adjacent to stream channels. For example, a road located adjacent to a stream can be a chronic source of sediment. If the road changes the morphological characteristics of the stream, this can set forth a chain reaction of channel adjustments that can result in accelerated bed and bank erosion, which produces excessive sediment.

Roads can result in changes in channel morphology, especially at road crossing locations. Poorly placed roads can encroach on stream channel and floodplain areas. Many older roads were constructed very close to stream channel areas, often in the floodplain. Often streams were straightened to accommodate road routing. Sometimes roads capture flow out of the channel and can result in stream re-routing down the road. Unpaved roads are the most common source of sediment to streams on NFS lands. Excessive sediment loading often leads to changes in channel morphology because of pool filling, widening of the channel, and making the channel shallower. These types of changes in channel morphology are reflected in changes in width to depth ratios, number of pools, pool depth, bank angle, and amount of undercut bank. Roads can permanently affect wetlands by interrupting natural flow paths and reducing vegetation. Roads can be a source of invasive weed species. Road crossing locations often create migration barriers to fish and other aquatic species, thereby fragmenting habitat.

Roads result in a form of semi-permanent vegetation removal. Roads in riparian areas create a loss of riparian vegetation which can influence the amount of solar radiation and water temperature regimes and amount of wood available for recruitment into the stream ecosystem. Loss of riparian vegetation can influence the amount of solar radiation reaching a water body and increase water temperatures and amount of wood available for recruitment into the stream ecosystem. These changes can ultimately lead to shifts in dissolved oxygen and pH. In addition, removal of riparian vegetation can increase nitrate levels which can increase the biological activity in water. Greater temperature fluctuations (diurnal and seasonal) can also occur when riparian vegetation is removed or decreased. The addition of nutrients in the stream ecosystem and reduced wood recruitment can affect the physical processes that create habitat complexity, such as deep pools and material available for hiding cover.

Road systems can change a natural hydrologic regime by altering natural flow patterns, particularly on hill slopes, thereby reducing infiltration and increasing surface runoff that may desynchronize flow regimes. Where a dense road network is well connected to the stream network, it can be an “extension” of the actual stream network. This can result in a more rapid delivery of water to the mouth of a watershed during snow melts and storm events, which can increase peak flows. Wetlands may be easily dewatered by road intersections that increase drainage efficiency in those areas allowing for a conversion to upland plant communities or facilitate exotic plant invasion.

Alternative A – No-action Alternative

Recent activities have helped to improve soil and aquatic resource conditions through changes in road and travel management. Forest roads that are maintained on an annual basis are typically those roads that have the most administrative and visitor use. Roads that have been closed, or receive limited visitor use, or have been decommissioned have revegetated to some degree. During the last several years, many roads that are graded have had new surfacing such as gravel or oil to reduce the rate of road deterioration and subsequent erosion from road surfaces (INFISH RF-2 and RF-3). Several roads have been moved out of riparian areas or decommissioned. Culverts have been installed or removed at stream crossings that were contributing sediment directly to the aquatic ecosystem or impeding passage of aquatic organisms (INFISH RF-4 and RF-5). Although there have been improvements in the overall road network, roads and stream crossings will continue to provide effects to the soil and aquatic ecosystem. Maintenance, closure, and decommissioning of roads are expected to continue at similar levels or slightly increased levels compared to more recent management.

Alternatives B Modified, C, and D

Forestwide direction common to all action alternatives will lead toward improvement regarding the effects of roads on watersheds, soils, riparian, and aquatic habitat and species.

As described under "General Effects," roads are a key contributor to watershed condition (see also appendix D). FW-OBJ-WTR 01 and 02 aim to remove or mitigate risk factors that could include roads to improve watersheds and water quality.

The desired condition for access includes a transportation system that has minimal impacts on watersheds, riparian areas, and aquatic species including threatened, endangered, and sensitive species (FW-DC-AR-07).

FS-OBJ-AQH-03 aims to reconnect fragmented habitat in streams to increase the distribution of aquatic and riparian associated species. Road crossings are a primary cause of habitat fragmentation; therefore, forestwide direction promotes reducing the effects of roads on fragmented habitat.

Regular road maintenance and decommissioning or placing roads into intermittent stored service is an access objective (FW-OBJ-AR-03). Project-level design criteria directs that roads to be decommissioned or put into storage be treated to make them hydrologically stable in order to avoid futures risks to watershed conditions (FW-GDL-WTR-02).

Opportunities for road construction are greatest under Alternative D as it contains the most acres of MA6 (general forest) and least under Alternative C, which contains the most acres of recommended wilderness (MA1b), and backcountry (MA5)[1], which only allows for temporary road construction under limited circumstances.

Effects from Timber Harvest and Prescribed Fire

General Effects

Riparian vegetation removal influences channel morphology through increased potential sediment delivery to water bodies, reduced large wood recruitment, and subsequent changes in pool depth and complexity. Prescribed fire along streambanks and shorelines can result in variable amount and distribution of ground exposure, but these activities typically result in moderate to light severity fires and have little influence on riparian vegetation and ground litter removal and subsequent surface erosion. Loss of riparian vegetation can influence the amount of solar radiation reaching a water body and increase water temperatures. Greater temperature fluctuations (diurnal and seasonal) can also occur when riparian vegetation is removed or decreased.

Timber harvest has the potential to cause accelerated erosion primarily through construction of temporary roads and skid trails. Timber harvest can also affect flow regimes by reducing evapotranspiration, interception, and snow accumulation patterns and by increasing soil moisture and surface runoff. Use of natural, unplanned ignitions to meet resource objectives and

[1] This MA allows temporary road construction based on the May 28, 2010 - Secretary's Memorandum 1042-155 - Authority to Approve Road Construction and Timber Harvesting in Certain Lands Administered by the Forest Service, and the June 18, 2010 - Secretary's Re-delegation of Authority for Certain Activities in Inventoried Roadless Areas.

prescribed fire can affect flow regimes by reducing evapotranspiration, interception, and snow accumulation patterns, and by increasing soil moisture and surface runoff. Timber harvest directly adjacent to wetlands can reduce shade, raise water temperatures, and reduce the potential for recruitment of woody material. In the short-term, 2 to 3 years, prescribed fire can reduce vegetation upstream and around wetlands. This can cause delivery of sediment and nutrients from burned areas, as well as recruitment of woody material. Prescribed fire can also reduce the evapotranspiration demands and make more water available for wetlands. Over the long-term, greater than 2 to 3 years, prescribed fire is expected to improve riparian condition, if applied to meet site-specific riparian management objectives.

Alternative A – No-action Alternative

Timber harvest is prohibited in RHCAs except in specific situations, including when it can be used as a tool to improve riparian vegetation conditions (INFISH TM-1). Projects that use prescribed fire should be designed to improve riparian condition (INFISH FM-4).

A variety of timber harvest treatments, such as clearcut, partial cut, selection cut, and shelterwood have occurred in the past and most of those harvest units have been stocked, revegetated as a result of natural succession, or a combination of both. Historically, areas such as skid trails, temporary roads, and cutting units that included riparian vegetation removal or were constructed close to stream channels. Localized sedimentation and temperature increases are likely to have occurred. Overall, soil productivity and impacts to water quality and aquatic habitats may have occurred from past vegetation treatments, but natural recovery and improvements in present and future management techniques has mitigated or improved conditions of these resources.

Alternatives B Modified, C, and D

Forestwide direction for all action alternatives aspires to protect watersheds, soils, riparian, and aquatic habitat and species from detrimental effects due to timber harvest and prescribed fire. As restoration activities trend vegetation towards desired conditions, watershed health is expected to improve. FW-DC-WTR-01 emphasizes the protection of water quality during all management activities. FW-STD-WTR-01 ensures that source water areas for public water supplies are protected from ground-disturbing activities, including timber harvest and prescribed fire.

Desired conditions for soils include maintaining soil productivity and hydrologic function (FW-DC-SOIL-01), as well as minimizing effects and recovering areas that have incurred detrimental disturbance (FW-DC-SOIL-02). Restoring soil productivity on these areas is a forestwide objective (FW-OBJ-SOIL-01). Project-level design criteria contain direction to protect soils during vegetation treatment such as timber harvest and prescribed fire (FW-GDL-SOIL-01, 02, 03, and 04). FW-GDL-VEG-09 protects peatlands from management activities that disturb soil, vegetation, above and below groundwater flows, and/or water chemistry. Such activities include timber harvest and prescribed fire.

Opportunities for more intensive types and amounts of timber harvest are greatest under Alternative D because it has the most acres in MA6 (general forest), which allows for timber production (scheduled on a rotation basis). Alternative C is expected to have the least intensive timber harvest opportunities because it has the most MA1b (recommended wilderness, which does not allow timber harvest of any kind), and MA5 (backcountry, which only allows for limited timber harvest based on provisions in the Idaho Roadless Rule (36 CFR 294 Subpart C)) combined. More effects to watersheds, soils, riparian, and aquatic resources are generally expected with more intensive timber harvest (Alternative D) and less effects in Alternative C, with effects from Alternative B Modified being in between. The forestwide direction common to all alternatives is in place to minimize these effects and protect these resources regardless of alternative.

There are no differences among action alternatives for prescribed fire opportunities because prescribed fire is an allowable activity in all MAs whose acres differ between alternatives.

Effects from Recreation

General Effects

Permanent development and campground facilities in riparian areas can result in sediment increases to nearby streams, loss of stream bank vegetation, and reduced water infiltration. Associated human activities, such as off-highway vehicle use on trails and stream bank trampling, can also decrease ground cover and increased soil disturbances. Direct effects to channel morphology include the loss of pool volumes, habitat complexity, and decrease in the size of stream channel substrate. Recreation use (primarily ATV use) can cause soil compaction and loss of vegetation in wetlands and/or directly adjacent to them. This can reduce sub-surface water flow and increase surface runoff. Increases in surface runoff may contribute sediment to streams and associated aquatic habitats, depending on the proximity or connectedness to the hydrologic network. Facilities can be similar to roads in terms of potential effects. Facilities can permanently affect wetlands by interrupting natural flow paths and reducing vegetation.

Alternative A − No-action Alternative

Off-highway vehicles are a popular choice for outdoor recreation, but they do have the potential to affect soils and aquatic resources; particularly if unmanaged motor vehicle use (in the absence of snow covered ground conditions) is allowed. However, the IPNF published motor vehicle use maps (MVUMs) in 2009 per 36 CFR 212, designating those roads, trails, and areas that are open to motor vehicle use. Motor vehicle use off designated roads and trails and outside designated areas is prohibited by 36 CFR 261.13. Although past impacts from recreation trails and developed recreation sites have likely contributed to effects on soil and aquatic dependent resources, limiting motor vehicle use to designated routes and areas minimizes the potential for these effects.

In addition, INFISH (USDA Forest Service 1995a) directs recreation facilities, including trails and dispersed sites, to be located in a way that avoids adverse effects on riparian and aquatic resources, including relocating or closing sites that degrade riparian and aquatic habitats (INFISH RM-1). This direction also includes adjusting recreation practices that adversely affect riparian and aquatic resources (INFISH RM-2).

As populations increase and recreation technology improves, motorized recreation use is anticipated to increase. However, site-specific planning for route designations and management following INFISH would continue to minimize adverse effects to soils and aquatic resources.

The Forest has also been managing over-snow vehicle access for several decades. The Forest currently has 449,246 acres closed to all motor vehicles for most or all of the winter months. These areas were closed because of critical wildlife habitat or because they are special non-motorized areas for recreation under the 1987 Plan. No issues have been identified to indicate an impact to watersheds or soils from over-snow vehicle use. In the action alternatives, additional acres would be closed to over-snow use in recommended wilderness and RNAs.

Alternatives B Modified, C, and D

The protections from INFISH and Travel Management Rule direction described under Alternative A are also common to all action alternatives.

The objective common to all action alternatives for dispersed recreation sites will benefit riparian and aquatic resources by improving conditions through interpretation and education, by implementing human waste management techniques, and by physically improving sites at heavily used areas near water on the IPNF (FW-OBJ-AR-01). Desired conditions for access and recreation include completing and implementing motor vehicle use designations (FW-DC-AR-08), which will meet INFISH RM-2 by moving off-road vehicle use away from riparian and aquatic resources.

Current management and future trends in recreation management are likely to include relocation of trails and developed sites away from streams and riparian areas in order to meet the intent of the revised Forest Plan to protect water quality and aquatic habitats.

Effects from Mining

General Effects

Mining directly adjacent to wetlands, or within streams or floodplains that are connected to wetlands, can reduce water availability/flow and increase sedimentation and/or pollution. Mining of the stream channel causes direct increases of sediment. As equipment dredges stream channels, water flow immediately transports material downstream. In addition, placer mining can cause bank erosion from equipment use and loss of riparian vegetation. Loss of riparian vegetation through mining activities can influence the amount of solar radiation and water temperature regimes. These changes can ultimately lead to shifts in dissolved oxygen and pH. In addition, removal of riparian vegetation can increase nitrate levels that can increase the biological production in water.

Clean-up of mining related heavy metals contamination in the Coeur d'Alene basin under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) will continue into the future through the life of the Plan. Settlements with several mining companies including ASARCO and Hecla will result in an accelerated pace of clean-up activities lead by the EPA. The EPAs 10 year implementation plan, released in November of 2012, shows the initial focus of this future work to be mainly in the developed areas of the Silver Valley along the South Fork Coeur d'Alene River. These activities will include property remediation, road surfacing, water treatment, and remedy protection projects. In addition, source areas in the 9-mile and Canyon Creek watersheds will be largely addressed by consolidating and containing contaminants in repositories. This work will be ongoing through the next 10 years with similar actions taken on subsequent priorities once completed.

In concert with the EPA clean-up effort the USDA, DOI, Coeur d'Alene Tribe, and the state of Idaho will jointly work towards implementing projects across the Coeur d'Alene basin supporting restoration of natural resources and services which were injured as a result of the heavy metals contamination. It is probable that these projects, also supported by settlement funds, will be implemented for multiple decades starting in 2015 and will likely be a combination of efforts that restore, rehabilitate, replace, or acquire the equivalent of the injured natural resources and the services they provide.

Alternative A − No-action Alternative
INFISH contains several standards and guidelines for minimizing effects of mining on riparian and aquatic resources (INFISH MM-1-6).

Alternatives B Modified, C, and D
INFISH contains several standards and guidelines for minimizing effects of mining on riparian and aquatic resources (INFISH MM-1-6).

Effects from Dams and Diversions

General Effects
Dams and diversions can change the streamflow regimes, alter sediment transport through aquatic ecosystems, and affect water chemistry. Water released from the bottom of a reservoir is often much colder than natural streams and contains high concentrations of nutrients. Diversions can create changes in water chemistry by altering the temperature regime. Usually, smaller volumes of water tend to heat up faster than larger volumes. Higher water temperatures result in increased biological activity and decreased dissolved oxygen. These changes can often result in a different composition of aquatic biota downstream of a dam. Types of changes are a function of how a particular dam is operated to achieve power generation and flood control goals. If a dam is operated for power generation, flows often fluctuate on a daily basis (ramping) for peak power demand. Annual floods are often “buffered” by dams and their reservoirs, resulting in smaller annual floods. Diversions change flow regimes simply by making less water available, particularly during the summer months. Dams interrupt sediment transport in streams and rivers, and can change availability of sediment in two ways: (1) Immediately downstream of dams there is a deficiency of sediment which can cause channel degradation and accelerated bank erosion. These effects are variable and can be seen several miles downstream of a dam. (2) Dams also can cause channels to aggrades or “fill with sediment” because they reduce the frequency and magnitude of floods. Removal of water from streams during a substantial part of the year reduces the volume of water (energy) available to transport the sediment load and this can result in aggradations downstream of the structure. Dams and diversions often create barriers to migrating aquatic species.

Alternative A − No-action Alternative
INFISH direction for dams and diversions is included in standards and guidelines (INFISH LH-1, LH-2).

Alternatives B Modified, C, and D
In addition to INFISH direction, forestwide direction common to all action alternatives includes desired conditions and objectives to protect or minimize effects from dams and diversions. Flow conditions that fully support beneficial uses and meet the ecological and habitat needs of aquatic species and provide for natural water and sediment conveyance as well as overall channel maintenance are supported in the desired conditions (FW-DC-WTR-02 and 03; FW-DC-RIP-02). Connectivity between waterbodies to support migrating aquatic species is a desired condition (FW-DC-AQH-02) and is an objective (FW-OBJ-AQH-03). While most dams on the IPNF are stressors that are not under Forest Service control, cooperation and coordination with state agencies, federal agencies, tribes, and other groups may be used where possible to achieve upward trends of aquatic species (FS-DC-AQS-03), such as through connection of habitat around dams and diversions. There are no differences among action alternatives for dams and diversions because their construction is an allowable activity in all MAs whose acres differ between alternatives.

Effects from Livestock Grazing

General Effects

Livestock grazing near streams can result in changes in channel morphology (Belsky et al. 1999). Livestock trailing, chiseling, and general soil displacement along stream bank areas can result in collapse of undercut bank areas and an overall increase in bank angle, loss of bank cover, and stream widening along the entire stream reach. Over long periods of time grazing can lead to the entire channel becoming down-cut to the point that a gully forms and a new channel is formed at the bottom of the gully. This type and extent of down-cutting results in an entire channel type change. Livestock trampling and hoof chiseling along streambanks can increase ground exposure, surface erosion, and increased sedimentation. Concentrated livestock waste can cause eutrophication of lakes and ponds. Livestock grazing directly in wetlands or immediately adjacent to them can cause soil compaction, hummocking, and loss of vegetation. This ultimately inhibits sub-surface water flow.

Removal of riparian vegetation through livestock management can influence the amount of solar radiation and water temperature regimes. These changes can ultimately lead to shifts in dissolved oxygen and pH. In addition, removal of riparian vegetation can increase nitrate levels which can increase the biological production in water. Loss of riparian vegetation can influence the amount of solar radiation reaching a water body and increase water temperatures. Greater temperature fluctuations (diurnal and seasonal) can also occur when riparian vegetation is removed or decreased. Livestock grazing has the potential to cause increased sediment delivery through trampling of stream banks and by removal of riparian vegetation.

Alternative A – No-action Alternative

Livestock grazing is a minor component of management on the planning unit and would continue to occur across all MAs. Although livestock grazing is not a large management component on the Forest, there may be localized effects of past management. Livestock management has only slightly changed since the last planning period and livestock stocking rates are less than historical levels.

INFISH standards and guidelines that protect or minimize effects to riparian and aquatic resources from livestock grazing include modifying grazing practices, locating new facilities outside of RHCAs, relocating or closing facilities, and limiting livestock handling efforts (INFISH GM-1, 2, and 3).

Alternatives B Modified, C, and D

Opportunities for more grazing are higher under Alternative B Modified and D than Alternative C, because C has more acres of recommended wilderness (MA1b), which does not allow grazing. It is unlikely that grazing will increase under any alternative because of the lack of non-transitory range land on the IPNF.

As allotment management plans are revised and incorporate forestwide direction common to all action alternatives (i.e., FW-GDL-RIP-02, and INFISH), these revisions will improve soil and water quality conditions within allotments for all action alternatives.

Effects from Fire Suppression

General Effects

Long-term fire suppression causes forest successional processes to continue which can increase evapotranspiration and interception, potentially resulting in less water available for wetlands. In many cases, lack of fire can lead to the encroachment of woody species (primarily shrubs) into peatland habitats, which could lead to competitive exclusion of herbaceous species. Suppression of natural fire regimes causes fuel loads to accumulate. When wildfire does occur, the intensity and severity are often higher than they would be with more natural levels of fuel. This can result in higher rates of fuel consumption and availability of ash and nutrients that can be delivered to aquatic environments. Severe fires may also remove virtually all riparian vegetation and ground cover; and result in soil erosion and sedimentation to nearby water bodies and loss of important transitional habitats for aquatic species such as amphibians and insects. Suppression of natural fire regimes results in forests that have more trees and associated leaf area. This results in higher evapotranspiration and interception levels, which leaves decreased amounts of water available for surface and sub-surface flow. Lower levels of stream flow can affect the aquatic species as a result of warmer water temperatures and changes in water chemistry. In addition, fire suppression can allow fuels to accumulate above natural levels, which can cause wildfires to burn more severely. This process can change infiltration characteristics of the soil and change hydrologic characteristics. Fire suppression activities, such as retardant use and drafting water from streams, can also affect riparian and aquatic resources.

Alternative A – No-action Alternative

INFISH standards and guidelines contain direction on fuel treatment and fire suppression strategies (INFISH FM-1), locating fire suppression centers for incident activities outside of RHCAs (INFISH FM-2), avoiding delivery of chemical retardant to surface waters (INFISH FM-3), and immediately establishing emergency teams to rehabilitate areas significantly damaged by wildfire (INFISH FM-5).

Alternatives B Modified, C, and D

In addition to protections provided by INFISH direction, forestwide direction common to all action alternatives included guidelines to minimize effects to RHCAs from fire suppression activities through the implementation of minimum impact suppression tactics (FW-GDL-RIP-03), as well as to protect fish and aquatic organisms while drafting water by screening pumps and locating intakes away from spawning gravels (FW-GDL-RIP-04).

Cumulative Effects

Soil-and aquatic-dependent resources are greatly influenced by all activities occurring within the Forest boundaries and can be a good indicator of large-scale cumulative effects. Nearly all activities proposed in the revised Forest Plan have the potential to affect soil- and aquatic-dependent resources. Of adverse effects, land management activities that disturb the soil surface have the greatest potential and risk. Risk increases with proximity or connectivity to the stream network and riparian habitats. Mitigation of the cumulative effects to soil-and aquatic-dependent resources is controlled through management direction provided for in the revised Forest Plan and through the use of BMPs and other watershed conservation practices at the project level. These practices will minimize the risk for ground-disturbing activities to have far reaching impacts to soil and aquatic resources by controlling the timing and location of these activities. Management activities on the Forest that may cumulatively affect water quality are: roads, vegetation management, recreation, livestock grazing, and mining.

The cumulative effect of these activities and uses will continue to be expressed in fish and amphibian populations as a result of improvements in the quality of aquatic habitats. Fish populations and other aquatic-dependent species will be maintained and are likely to increase, within the Forest boundary, as stream and riparian conditions are improved through restoration activities (although stochastic events such as disease, climate changes, natural disturbances, or aquatic nuisance species will continue to have population effects beyond the control of management activities).

Climate Change

Effects of climate change on watershed processes and aquatic ecosystems in the West, including northern Idaho, are described in detail in the KIPZ Climate Change Report (USDA Forest Service 2010b). The paper concludes that the way to reduce impacts from climate change is to increase the resiliency of watersheds and forests to the changes in disturbance regimes that result from climate change. This synthesis suggests that the way to increase resiliency of watersheds is to maintain and restore watershed processes and aquatic ecosystems.

The following section is excerpted from the KIPZ Climate Change Report:

Over the last 50 years, average spring snowpack (April 1 snow water equivalent) has declined and average snowmelt runoff is occurring earlier in the spring. These trends are observed for northern Idaho, the entire Pacific Northwest, and much of the western U.S. Since the available data is limited to the last 50 years, it is not clear whether these trends are persistent long-term trends or reflect short-term decade-to-decade variability that may reverse in coming years. Several recent studies of the same trends across the entire western U.S. have concluded that natural variability explains some, but not all, of the west-wide trend in decreasing spring snowpack and earlier snowmelt runoff.

Potential changes in streamflow and rising stream temperatures are likely to increase risks to maintaining existing populations of native, cold-water aquatic species. Over the last century, most native fish and amphibians have declined in abundance and distribution throughout the western U.S., including northern Idaho. It is unknown whether, or to what degree, these changes are attributable to climate trends. Potential climate-induced trends of altered streamflow timing, lower summer flows, and increased water temperature will likely reduce the amount, quality, and distribution of habitat suitable for native trout and contribute to fragmentation of existing populations. Climate-related impacts are likely to add cumulatively to other stressors on native fish and amphibian species. Non-native trout and other aquatic species better adapted to warm water temperatures may increase in abundance and expand their existing ranges.

These climatic and hydrologic trends, combined with climate-related trends in wildfires and forest mortality from insects and diseases, can significantly affect aquatic ecosystems and species (Casola et al. 2005, Dunham et al. 2003, Dunham et al. 2007, Isaak et al. 2010). A growing body of literature has linked these hydrologic trends with impacts to aquatic ecosystems and species in western North America, often as a result of climate-related factors affecting stream temperatures and the distribution of thermally suitable habitat (Bartholow 2005, Isaak et al. 2010, Kaushal et al. 2010, Morrison et al. 2002, Petersen and Kitchell 2001). Lower summer streamflows and higher air temperatures, as observed over recent decades in northern Idaho, are generally expected to result in increased stream temperatures. However, stream temperatures are controlled by a complex set of site-specific variables including shading from riparian vegetation, wind velocity, relative humidity, geomorphic factors, groundwater inflow, and hyporheic flow (Caissie 2006).

Potential impacts to fish include:

- Egg incubation and fry emergence may be adversely affected due to flood flows, dewatering, and/or water temperatures. Shifts in the timing and magnitude of natural runoff will likely introduce new selection pressures that may cause changes in the most productive timing or areas for spawning.

- Spring/summer rearing may be adversely affected due to reduction in stream flow and higher water temperatures.
- Overwinter survival may be positively affected by higher winter water temperatures enabling fish to feed more actively, potentially increasing growth rates if sufficient food is available. If food is limited, the elevated metabolic demands could reduce winter growth and survival.

Bull trout is the native trout species most vulnerable to potential increases in stream temperatures because it has the coldest range of thermally suitable habitat among native salmonids in the Northern Rockies. For this species, increasing stream temperatures may cause a net loss of habitat because areas are not available further upstream to replace those that become unsuitably warm. For rainbow trout, which tolerates warmer stream temperatures better than bull trout and is often limited by upstream temperatures that are too cold, warming may only shift suitable habitats toward higher elevation stream reaches with little or no net change in total amount of thermally suitable habitat (Rieman and Isaak 2010). Cutthroat trout in high-elevation streams currently are commonly limited by low water temperatures and short growing seasons (Coleman and Fausch 2007, Harig and Fausch 2002). These populations may benefit from climate-induced increases in thermally-suitable habitat in higher elevation stream reaches (Rieman and Isaak 2010). However, warmer stream temperatures may also lead to non-native fish and other aquatic species moving into previously unsuitable upstream areas where they will compete with native species (Rieman et al. 2007, Rahel and Olden 2008, Fausch et al. 2009, Haak et al. 2010)

Projected increases in air temperatures, along with projected decreases in summer stream flows, will likely lead to warmer stream temperatures in the Columbia River basin, particularly during summer low-flow periods (Casola et al. 2005). Recent scientific publications suggest that projected air temperature changes are likely to reduce the distribution of thermally-suitable natal habitat for bull trout, fragment existing populations, and increase risk of local extirpation (Rieman et al. 2007, Isaak et al. 2010). However, the risk of climate-induced extirpation in subbasins of northern Idaho may be less than other, relatively drier and warmer subbasins in the Columbia River basin (Rieman et al. 2007).

Other recent publications conclude that westslope cutthroat trout, which can generally tolerate warmer stream temperatures than bull trout, is at a low risk for increasing summer stream temperatures in most basins within its range, including the Clark Fork, Coeur d'Alene, and Kootenai basins of northern Idaho (Haak et al. 2010). These studies also conclude that stream temperature impacts resulting from projected climate-change-induced increases in wildfire extent and severity posed a moderate or high risk of cutthroat trout extirpation in 46 percent of occupied subwatersheds throughout the species' occupied range. However, wildfire posed a moderate or high risk to cutthroat trout in only 3 percent of subwatersheds in the Coeur d'Alene and Kootenai basins, but 45 percent of subwatersheds in the Clark Fork Basin (Haak et al. 2010).

Kootenai River white sturgeon, spawn in May or June in water temperatures around 46.4-48.2°F and cease to spawn at 53.6°F (Paragamian et al. 2001). Under future scenarios of warming water temperatures and reduced summer flows there is a possibility that the white sturgeon may be stimulated to spawn earlier than the May-June period. This may actually be advantageous for white sturgeon, for both egg incubation/survival as well as flow/velocity requirements for successful recruitment (ISAB 2007).

Haak et al. (2010) conclude that risks to native trout resulting from projected increases in winter flood risk in north Idaho are greater than risks associated with climate-induced changes in wildfire, drought, or stream temperatures. They estimate that cutthroat trout in most subwatersheds in the Clark Fork, Coeur d'Alene, and Kootenai basins face high to moderate risk of increased winter flooding (Haak et al. 2010).

Terrestrial Wildlife

This wildlife section of the FEIS is a condensed version of the extensive wildlife specialist's report in the project record. For additional information and analysis beyond what is covered in this section of the FEIS, please see the wildlife specialist's report.

Introduction

The revised Forest Plan would improve or maintain habitat conditions for native wildlife, guide habitat restoration efforts, and provide for the long-term sustainability of habitats.

The IPNF provides habitat for a great variety of wildlife. This includes almost 300 species of birds, from the calliope hummingbird to the bald eagle, and more than 50 species of mammals, from the little brown bat to the grizzly bear. Many of the species that exist today on the IPNF were present before European settlement. The AMS Technical Report (2003) provides a list of species known to occur in the Forest. Using information gathered during the revision process, this species list was updated to reflect appropriate changes (additions, deletions, and modifications).

Past resource use and the exclusion of fire for almost 100 years has caused changes in some wildlife habitats. These changes have benefited some species and been detrimental to others. As documented in the Forest Plan revision analysis, defining and measuring the status of ecosystems now, and comparing them to desired future conditions, is the foundation for sustainability of ecosystems on the IPNF. The vegetation features assessed as "key indicators" for the wildlife considered in the EIS are changes in forest composition, structure, and pattern in addition to security habitat (non-motorized areas). These features are very much related to the quality and quantity of wildlife habitats.

With more than 300 species on the IPNF, it is impossible to track them all, so certain groups are carried forward in this EIS. Landbirds are of interest not only for wildlife viewing but also because of the international interest in conservation and the protection afforded them through the Migratory Bird Treaty Act and Executive Order 13186. Threatened and endangered species are considered because of the requirements of the Endangered Species Act. Northern Region sensitive species or their habitat found on the IPNF is discussed in detail. These species can be used to help insure continued diversity and viability of species as required in NFMA and 36 CFR 219.19.

Threatened or endangered species for the IPNF includes Canada lynx, woodland caribou, and grizzly bear. Critical habitat for Canada lynx and woodland caribou occurs on the IPNF. In 2011, the Region 1 Sensitive Species list was amended (USDA 2011a). Proposed terrestrial MIS for the IPNF include Rocky Mountain elk, and a landbird assemblage of general insectivores (dusky flycatcher, olive-sided flycatcher, chipping sparrow, Hammond's flycatcher, and hairy woodpecker).

The revised Forest Plan would establish direction for various wildlife habitats in relation to type, amount, spatial pattern, and function. The Plan would also include direction for the protection, enhancement, and restoration of threatened and endangered species, sensitive species, and their habitats. The interdisciplinary team worked closely to integrate plan direction during the development of the revised Forest Plan components; in particular wildlife, vegetation, fire, and access/recreation.

Cooperation between the state of Idaho and federal agencies is useful to ensure proper management of the fish and wildlife resources. The Comprehensive Wildlife Conservation Strategy for Idaho (IDFG 2005), as well as other state species management plans (e.g., elk, wolf, mule deer, and white-tailed deer) has been reviewed during the development of the revised Forest Plan.

Legal and Administrative Framework

Law and Executive Orders

- **The National Forest Management Act (NFMA) of 1976:** The NFMA states that the Secretary shall "promulgate regulations," under the principles of the Multiple-Use Sustained-Yield Act of 1960, to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives, and within the multiple-use objectives of a land management plan adopted pursuant to this section, provide, where appropriate to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the Plan" (P.L. 94-588, Sec. 5 (g)(3)(B)).
- **Sikes Act of 1960:** Forest Service policies recognize that state agencies and Indian Tribes are responsible for the management of animals and assign national forests a role in cooperatively managing wildlife habitat.
- **The Migratory Bird Treaty Act of 1918:** Addresses concerns for migratory birds. In a subsequent MOU 2001, with the USFWS, the Forest Service agreed to: (a) incorporate migratory bird habitat and population objectives and recommendations into the agency planning process in cooperation with other governments, state, federal agencies, and non-federal partners; (b) strive to protect, restore, enhance, and manage habitat of migratory birds, and prevent the further loss or degradation of remaining habitats on NFS lands.
- **The Endangered Species Act of 1973, as amended:** Provides requirements for federal agencies with regard to species listed under the act. Section 2 states that ". . . all federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this act." Section 5 directs the Secretary of Agriculture to "establish and implement a program to conserve fish, wildlife, and plants," including federally listed species. Section 7 directs federal departments and agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats.
- **Executive Order #13186 (January 10, 2001):** This EO, "Responsibilities of Federal Agencies to Protect Migratory Birds," was issued by President Bill Clinton in furtherance of the purposes of the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Acts, the Fish and Wildlife Coordination Act, the Endangered Species Act, and the National Environmental Policy Act. This order requires including effects of federal actions on migratory birds as part of the environmental analysis process. On January 17, 2001, the USDA Forest Service and the USDI Fish and Wildlife Service signed a Memorandum of Understanding to complement the Executive Order.

Regulation and Policy

- **Forest Service policy included within FSM 2670:** States that regional sensitive species will be identified and management taken to ensure that these species do not trend toward federal listing as a result of management actions.

- **The USDA policy:** For wildlife, fish, and plant habitat management in NFS lands is presented in Departmental Regulation 9500-4. This policy states that by means of the planning process habitat goals will be established for plants and animals, including wildlife and fish species in demand for hunting, fishing, and trapping and those with special habitat needs. This regulation also directs the Forest Service to: (a) manage habitats for all existing native and desired nonnative plants, fish, and wildlife species in order to maintain at least viable populations of such species; (b) conduct activities and programs to assist in the identification and recovery of threatened and endangered plant and animal species; and (c) avoid actions which may cause a species to become threatened or endangered.
- **Additional requirements for wildlife were also identified and included in the 1982 Planning Procedures (36 CFR 219.19):** This section of the 1982 Planning Regulations states that fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. Management indicator species are selected under the 1982 Planning Regulations and objectives for the maintenance and improvement of habitat are established. Among other components of the 1982 Planning Regulations, there is direction to consult with biologists from other agencies, as well as consider the effects of pest and fire management on fish and wildlife populations.

Key Indicators

- Changes in forest composition, structure, and pattern; and
- Security habitat (non-motorized areas).

Analysis Area

In general, the analysis area for wildlife includes all lands managed by the IPNF; however, for the purposes of this document it may include segments outside NFS boundaries. In some cases NFS lands may provide all or a high percentage of the habitat for a given species; however, in most instances, wildlife generally move from area to area and habitats on NFS lands may be important to a species survival. Cumulative effects analyses generally include lands within other ownerships immediately adjacent to the Forest, although for some wide-ranging species the analysis area may have been a little larger and included an evaluation of connectivity between larger areas of habitat (i.e., connectivity for grizzly bears between recovery zones).

In most cases, the temporal scale of analysis included the life of the revised Forest Plan. Some habitat analyses evaluated a longer timeframe. The ERG report (ERG 2012), for example, assessed habitat changes for the next five decades. Past actions were also considered as they play a role in determining the existing conditions and may interact cumulatively with the effects of the revised Forest Plan.

Please see the specific species' sections for more information regarding specific analyses. For example, the grizzly bear section explains the various measures used to quantify habitat (e.g., core area, open motorized route density, total motorized route density).

The revised Forest Plan would have fewer MAs (7) than the 1987 Plan (19); they would be much larger and would generally follow distinguishable features on the landscape. Management direction for wildlife habitats and species in the revised Forest Plan would be included in forestwide and management area desired conditions, objectives, standards, and guidelines and are to be incorporated into all land management activities. Additional direction can be found at the geographic area level.

Providing for ecological diversity is an outcome of the revised Forest Plan. It starts with a comparison of the current abundance and condition of various habitats with ecological reference conditions (historic range of variability) based on our knowledge of the past and on our understanding of ecological processes (e.g., fire, flooding, insects, and disease). This coarse filter approach to providing species viability is reflected in the vegetation desired conditions in the revised Forest Plan. The coarse filter approach forms the foundation of the analysis for each species. The report by ERG (2012) assessed the effects on selected species of moving towards the desired conditions for vegetation. It is important to note that ERG (2012) found that viability would be maintained for all the species analyzed in that report. The companion approach to ecosystem diversity (coarse filter) is the “fine filter” approach in which conservation strategies are used for individual species or groups of species to contribute to species diversity. The fine filter approach narrows the focus to those species that require habitat that may be outside the range of variation and are not covered under the coarse filter. In addition, there are species whose populations have been reduced to levels requiring special management considerations (i.e., some species listed as threatened, endangered, or sensitive). This fine filter approach is reflected in the specific direction in the wildlife sections of the revised Forest Plan. Each species’ assessment in this report evaluates the effects of the coarse filter, fine filter, and other components in the revised Forest Plan.

A disruption of natural processes (e.g., fire suppression) can impact diversity and lead to a departure from historic conditions (page 2-3 in CEQ 1993). The basic goal of biodiversity conservation is to maintain naturally occurring ecosystems, communities, and native species (page 5 in CEQ 1993). Maintaining or mimicking natural processes and naturally occurring structural diversity, promoting natural pattern and connectivity, restoring ecosystems, communities, and species, and protecting rare species or sensitive environments are all means to maintain biodiversity in an ecosystem (page 7 in CEQ 1993) and fit into the coarse filter/fine filter approach utilized in this Forest Plan revision process.

A variety of sources were used to determine historic and existing vegetation conditions on the IPNF. The development of management recommendations for the revised Forest Plan to maintain or restore ecological communities was based on the historic range of variability and desired future condition (influenced by climate change) (see “Vegetation” section of the EIS). Movement toward the desired conditions for vegetation under the revised Forest Plan would provide for an array of ecological communities of sufficient size, structure, and distribution that is expected to maintain habitats for the vast majority of native species that occur on the Forest.

Population changes can occur when there is a change in habitat (e.g., canopy cover, patch size, tree dominance type). However, fluctuations in species populations will occur even when there has not been a change in habitat. These fluctuations may be due to climatic changes, disease, predation, excessive harvest, competition or displacement from exotic species, and other factors not related to habitat changes. For migratory species, a change in population may not represent changes in local forest habitat conditions. Many species migrate at different times of the year and are influenced by activities or conditions that occur outside the Forest.

Habitat Restoration

One of the main outcomes of the direction in the revised Forest Plan is the restoration of habitat for native wildlife species. The revised Forest Plan provides more flexibility in the tools available to accomplish this habitat restoration in the long-term. This is particularly true with regard to fire and natural disturbance processes. Under the revised Forest Plan there is more emphasis and flexibility to use fire and natural disturbance processes to trend habitat towards the desired conditions for vegetation in the Plan. Those desired conditions are based on historic conditions and potential climate change, both of which consider natural disturbance. By allowing natural disturbance to function nearer to historic conditions, then the approximate quantity, quality, and pattern of wildlife habitat across the Forest would be nearer to what our native species evolved with in this part of their range. By moving towards the conditions they evolved with, species viability would be maintained.

Active restoration through mechanical treatments can help in moving towards the desired conditions. However, given the predicted budgets, this tool would have limited success in trending habitat towards the desired conditions. The tool that has the best chance of success is fire and natural disturbance (both active and passive restoration). Natural disturbance has greater influence over the rate at which the Forest trends towards the desired conditions. Many of the MAs in the revised Forest Plan provide for greater emphasis on natural disturbance processes compared to the 1987 Forest Plan. In particular, MAs 1 and 5 would have natural disturbance processes as the primary means of trending habitat towards desired conditions.

Security habitat is also important to a variety of species on the Forest. Areas with lower levels of human presence, in particular motorized access, are important for providing areas of limited human disturbance of native wildlife.

Connectivity is an important component of wildlife habitat restoration and maintenance. By managing with a greater emphasis on natural disturbance processes, the revised Forest Plan would provide for the kinds and pattern of habitats, and therefore, connectivity that our native species evolved with on the Forest. Connectivity would be improved over the 1987 Forest Plan. Additionally, in order to maintain or improve connectivity between large areas of NFS lands, there is increased direction in the revised Forest Plan to plan and protect crossing structures across highways and other potential barriers, and to protect the surrounding areas in order to promote connectivity.

This restoration philosophy forms the foundation of the entire wildlife analysis that follows in this document. The revised Forest Plan provides the tools to accomplish this restoration and maintenance of wildlife habitat, and the result would be maintained or improved viability of our native wildlife.

Federally Listed Species

Threatened, endangered, and proposed species are managed under the authority of the Federal Endangered Species Act (ESA) of 1973 (PL 93-205 as amended) which requires that federal agencies: 1) carry out programs for the conservation of listed species (Sec. 7(a)(1)) and 2) insure that any agency action is not likely to jeopardize the continued existence of listed species (Sec. 7(a)(2)).

Species listed under the ESA fall into one of four categories: threatened, endangered, proposed, or candidate. The Forest Service has a legal requirement to maintain or improve habitat conditions for threatened, endangered, and proposed species under the ESA. Table 35 displays changes in federally listed species from the 1987 Forest Plan to current (2013).

Table 35. Status of Federally Listed Species

Species Common Name	Species Scientific Name	Status 1987	Status 2013
Bald eagle[1]	*Haleaeitus leucocephalus*	Endangered	Delisted
Canada lynx[2]	*Lynx Canadensis*	Not Listed	Threatened
Gray wolf[1]	*Canis lupus*	Endangered	Delisted
Gray wolf[1]	*Canis lupus – IPNF south of Interstate 90*	Experimental non-essential	Delisted
Grizzly bear	*Ursus arctos horribilis*	Threatened	Threatened
Peregrine falcon[1]	*Falco peregrinus*	Endangered	Delisted
Woodland caribou[2]	*Rangifer tarandus*	Endangered	Endangered
Wolverine	*Gulo gulo luscus*	Not Listed	Proposed Threatened

[1] Analyzed under Sensitive Species section
[2] Critical Habitat also present on the IPNF

Recovery plans and biological opinions are developed for threatened and endangered species by the USFWS and provide goals and actions needed to recover species. Recovery plans are used as a reference document in identifying activities and steps that can be incorporated into forest management to promote the recovery of the species.

National forests are responsible for ensuring that any action funded, authorized, or carried out be done in a manner that does not jeopardize the continued existence of threatened and endangered species or adversely modify their critical habitat. This responsibility, under Section 7 of the ESA is fulfilled through the development of biological assessments that examine the proposed actions with respect to their potential for influencing threatened and endangered species or their habitat. If this objective analysis, conducted by qualified personnel, cannot clearly determine that the action will not affect threatened and endangered or their habitat, then consultation with the USFWS is initiated. Historically, the Forest has conducted frequent formal and informal consultations with the USFWS.

Management for threatened and endangered species will continue to use existing recovery plans and the most current scientific information available to aid in species recovery.

Retained Decisions Related to Terrestrial Threatened and Endangered Species

There are two previous decisions related to terrestrial threatened and endangered species that amended the 1987 Forest Plan and have been retained in this revised Forest Plan. The first was the 2007 Northern Rockies Lynx Management Direction (NRLMD). The purpose of that decision was to incorporate management direction in land management plans that would conserve and promote the recovery of Canada lynx by reducing or eliminating adverse effects from land management activities on NFS lands while preserving the overall multiple-use direction of the plans. The direction found in the NRLMD is still valid and has been retained to provide the foundation for lynx habitat management under the revised Forest Plan. The retained NRLMD direction has been supplemented with additional direction in the revised Forest Plan relevant to lynx habitat management. The NRLMD has been extended to cover the life of the revised Forest Plan. The effects on critical habitat of managing the Forest under the NRLMD have been assessed as part of this Forest Plan revision process and the accompanying consultation with USFWS.

The second decision retained that is relevant for terrestrial threatened and endangered species management was the 2011 Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones (Access Amendment). The purpose of the Access Amendment was to amend the forest plans to include a set of motorized access and security standards that met the agency's responsibilities under the Endangered Species Act to conserve and contribute to recovery of grizzly bears. This decision is still valid and is based upon the best available information for the Selkirk and Cabinet-Yaak recovery zones. The Access Amendment was retained and provides the foundation for grizzly bear security habitat management under the revised Forest Plan. The Access Amendment has been supplemented with additional direction in the revised Forest Plan relevant to grizzly bear habitat management.

Management Indicator Species

Table 36 summarizes the terrestrial management indicator species for the revised Forest Plan. More information can be found in the MIS section of this report and the KIPZ MIS selection documentation in the project record.

Table 36. MIS for the Idaho Panhandle National Forests

Species	Habitat Association	Indicator	Rationale for Selection
Rocky Mountain Elk	Forested stands (cover), and grasslands/shrub (forage)	Security Areas (acres and percent)	Elk are of high social importance and are sensitive to the availability of security habitat. Management activities that impact road use can alter security habitat. Monitoring of security habitat would be feasible through remote sensing (ex: travel route GIS layers)
Landbird Assemblage (insectivores)	Varies: open forest structures, mature forests, and snags	Varies: open forests/openings, burned forests, mature forests, snags	Moving towards the desired conditions for vegetation would restore or maintain habitat for some species of insectivores. The Forest will monitor movement towards the desired conditions for vegetation

Old Growth, Pileated Woodpecker, Marten, and Northern Goshawk

The effect of the revised Forest Plan on old growth habitat is analyzed in the "Vegetation" section of the FEIS and vegetation specialist's report. That analysis determined that the direction in the revised Forest Plan will retain existing old growth and develop additional old growth as the Plan is implemented. Therefore, old growth habitat will be retained for wildlife species that use that habitat, and additional habitat will be available in the future as this revised Forest Plan is implemented. There are no old growth obligate wildlife species that are solely dependent on this habitat on the Forest, although there are species that utilize old growth habitats if available. See the "Old Growth" section in the vegetation specialist's report and FEIS for more information regarding the effects of implementing the revised Forest Plan on old growth habitat. Additionally, old growth is discussed in the individual TES and MIS species sections in this report if that species can use old growth as habitat.

Pileated woodpecker, marten, and northern goshawk are not TES or MIS species for the Forest, nor are they solely dependent on old growth. ERG (2012) did do an analysis of the revised Forest Plan and whether implementation of the Plan would provide sufficient habitat for these three species. The conclusion was that sufficient habitat will be maintained, and that it was natural disturbance processes (e.g., fire, insects, and disease) that played a large role in determining the amount of habitat on the Forest. Please see the ERG report (ERG 2012) for more information regarding the impacts of the revised Forest Plan on habitat for these three species.

Goshawk, marten, and pileated woodpecker habitats were modeled by Ecosystem Research Group (ERG) in 2012 (ERG 2012). ERG modeled several scenarios for comparison purposes. Tables 37, 38, and 39 below display some of the relevant scenarios. The existing 1987 Forest Plan was modeled, as was a “no treatment” scenario where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. A warmer/drier climate over the next five decades as the climate changes was considered. Scenarios also considered that the current level of fire suppression would continue into the future and considered an increase in acres burned over time due to a warmer/drier climate and fuel loads.

The existing amount of goshawk habitat is below HRV and declines over the next five decades. The reason for the decline is natural disturbance which removes some habitat, but natural succession also adds some habitat over time, although not as much to compensate for the loss. Alternative B Modified results in more acres of goshawk habitat than the existing 1987 Forest Plan or the no treatment scenario, likely due to reductions in the amount of habitat lost to fire. As explained on page 97-98 in the Ecosystem Research Group (ERG) report (Ecosystem Research Group 2012), the results are very conservative. There are likely more habitats available to goshawks than shown in the analysis results because goshawks nest selection shows they use stands that are smaller or more open than used in this analysis. Additionally, territoriality determines the population density of goshawks on the Forest, not the total amount of habitat available. Habitat is well distributed across the Forest, so territoriality would be the determining factor, not total habitat quantity. The alternatives result in a similar amount of goshawk habitat. Goshawks are not at a viability risk under the revised Forest Plan (page 98 in ERG 2012).

Table 37. Acres of Goshawk Habitat

Decade	Alternative B Modified	1987 Forest Plan (acres)	No treatment Scenario (acres)
0	1,136,237	1,136,237	1,136,237
1	838,949	820,719	827,813
2	761,296	744,591	739,741
5	746,094	735,811	730,156

Source: Ecosystem Research Group 2012

Mehl et al. (2009) developed a report for the Idaho Department of Lands (IDL) that examined IDL’s goal of restoring/maintaining a 20 percent representation of historic habitat conditions on their lands in north Idaho. They assumed that the same 20 percent would be met on other land ownerships as well. They determined that aiming for a 20 percent representation of historic habitat conditions for native species would preclude future federal listing of species in northern Idaho, including goshawk (page 211 in Mehl et al. 2009). They stated that the objectives are not to return the entire landscape to historic conditions, but to provide sufficient amounts of similar ecosystems represented across the landscape to maintain native species (page 43 in Mehl et al. 2009). The revised Forest Plan for the IPNF does far more than aim to restore/maintain only 20 percent of historic habitat conditions for native species. The desired conditions for vegetation in the revised Forest Plan are based on historic conditions and natural disturbance processes rather than aiming for a lower percentage of representation of historic habitats.

Marten habitat was analyzed in two ways by ERG (Ecosystem Research Group 2012). First, they analyzed the amount of all marten habitat across the Forest, and secondly they analyzed the amount of only the mesic habitat across the Forest. Marten habitat is within HRV and remains so at the end of the next five decades. The mesic component of that habitat is currently within HRV but drops below HRV over the next five decades. The reason for the decline is increased wildfire over time that converts climax grand fir-redcedar cover types back to Douglas-fir or larch. Even with all marten habitat, wildfire, root disease, insects, forest growth, and succession are the driving factors determining the amount and pattern of marten habitat on the Forest. All alternatives have similar outcomes. Because all marten habitat remains within HRV, there is likely no viability risk (page 96 in Ecosystem Research Group 2012).

Table 38. Acres of Marten Habitat

Decade	Alternative B Modified		1987 Forest Plan (acres)		No treatment Scenario (acres)	
	All Habitat	Mesic	All Habitat	Mesic	All Habitat	Mesic
0	1,396,267	833,636	1,396,267	833,636	1,396,267	833,636
1	1,121,254	495,123	1,095,657	501,602	1,099,856	518,711
2	1,029,982	407,628	1,000,311	414,009	982,430	431,421
5	1,055,400	214,831	1,025,239	231,224	989,934	228,433

Source: Ecosystem Research Group 2012

Pileated woodpecker habitat was analyzed by ERG (ERG 2012). The existing amount of pileated habitat is within HRV and remains that way at the end of the next five decades. The results of all the alternatives are fairly similar. As stated on page 99 of ERG (2012), "…the effects of scenarios are minute compared to inevitable changes over time from wildfire, root disease, insects, and in-growth." Based on the findings in ERG (2012), there doesn't appear to be any viability concern with pileated woodpeckers.

Table 39. Acres of Pileated Woodpecker

Decade	Alternative B Modified	1987 Forest Plan (acres)	No treatment Scenario (acres)
0	572,687	572,687	572,687
1	436,163	425,938	436,474
2	575,268	562,038	577,227
5	588,103	566,215	571,846

Source: Ecosystem Research Group 2012

For these species, as with wildlife on the Forest in general, it is wildfire, insects/disease, in-growth, and stand succession that largely determines the amount and pattern of habitat on the Forest for these species rather than management activities (pages ES-1 and ES-2 in ERG 2012).

Organization of the Following Analysis

Each species is analyzed separately in the order listed in table 35. Each individual species section begins with an "Affected Environment" section. Within the affected environment is information on the habitat/life history needs and key stressors. The "Key Stressors" section is an important piece of the document and drives the effects analysis. The effects analysis looks at the direction in the revised Forest Plan in the form of goals, objectives, desired conditions, standards, and guidelines that impact the key stressors. It does not analyze direction in the Plan, or specific MAs or GAs, if they are not relevant to the key stressors or have some effect for the species. Stressors can be activities that have occurred in the past but may not be occurring presently, nor are they necessarily expected to occur in the future. These are simply activities that might impact lynx if not managed or mitigated. Stressors that are outside of Forest Service control include those activities that occur on non-NFS lands. Some, such as climate change, may have impacts on NFS lands but are not completely within the Forest's ability to stop or reduce all the impacts.

The “Environmental Consequences” section for each species is organized by “Effects Related to Key Stressors under Forest Service Control” (this is a section that addresses the key stressors specifically and ties the effects sections in the wildlife specialist’s report together) and “Cumulative Effects”. The effects related to “Key Stressors under Forest Service Control” section have been grouped by related stressors/themes to streamline the analysis. Lastly, there is an “Effects Determination” section that lays out the rationale for the effects determination.

Information on current management can be found in the “Affected Environment” section, and also under the “Effects” section if that information is relevant for comparisons to the effects analysis of the alternatives.

Changes between Draft and Final

Based on internal and public comments, feedback received during consultation with other agencies, new information, and updated analyses; several updates were made to the final wildlife specialist’s report.

- Supplemented analyses: many of the species sections underwent clarification and were supplemented with additional information. The report by Ecosystems Research Group (ERG 2012), which analyzed habitat changes for selected species over the next 50 years under the revised Forest Plan, was also incorporated into the FEIS and wildlife specialist’s report through citation and summarization of key sections of the ERG report. This augmented the viability analysis for selected species;
- Updated acres treated, acres open to motorized use, and MA acres;
- Alternative B Modified replaced Alternative B;
- A big game section was added in order to analyze effects to native ungulates that were not covered elsewhere in the analysis;
- Increased analysis related to the effects of over-snow motorized use. This includes a clarification of what would be closed to over-snow motorized use after the revised Forest Plan is finalized and what are the desired conditions that would be implemented through later site-specific analysis;
- Revised elk security analysis, FW-OBJ-WL-02, FW-GDL-WL-13, and the definition of elk security in the glossary;
- Updated T&E species sections to match the final biological assessment that was submitted to the USFWS between the DEIS and FEIS, and additional corrections to some of the information included in the Biological Assessment This includes an analysis of the effects to woodland caribou critical habitat from the revised Forest Plan;
- Inclusion of the updated lynx habitat mapping for the IPNF;

- Updated wolverine section to reflect the species being proposed for federal listing under the ESA and the threats identified by USFWS;
- The MIS section was updated and the KIPZ MIS selection documentation was finalized;
- Inclusion of a section disclosing effects of the revised Forest Plan on old growth, pileated woodpeckers, American marten, and northern goshawk;
- The wildlife forestwide desired conditions were rewritten to improve clarity while keeping the intent the same;
- Increased Geographic Area direction to provide wildlife connectivity;
- The forestwide wildlife objectives were adjusted to be realistic and achievable based on updated existing conditions; and
- Clarifications of the forestwide wildlife guidelines. The biggest change is to FW-WL-GDL-01, which in the draft covered a variety of species. This guideline is now specific to grizzly bears and the other species have been covered under a series of new guidelines or through editing of other existing guidelines.

Threatened, Endangered, and Proposed Species

The IPNF is home to two threatened species (Canada lynx and grizzly bear) and one endangered species (woodland caribou). Critical habitat occurs on the IPNF for both Canada lynx and woodland caribou. One proposed species also occurs: the North American wolverine.

Canada Lynx – Lynx canadensis

Affected Environment

Canada lynx are listed as a threatened species on the IPNF. Information on lynx biology and ecology can be found in; "Ecology and Conservation of Lynx in the United States" (often referred to as the Lynx Science report) by Ruggiero, et al. (2000). In addition, a conservation strategy and management assessment of the current state of the knowledge on lynx habitat management was prepared by a group of federal interagency biologists (referred to as the Lynx Biology Team) and is entitled, "The Canada Lynx Conservation Assessment and Strategy" (LCAS), (Ruediger et al. 2000). The LCAS is currently undergoing revision with an expected completion date of September 2013.

Status

The Canada lynx is a low density, wide-ranging forest carnivore with limited local distribution. The species is a year-round resident on the IPNF. In March of 1998, an interagency (USFWS, USFS, BLM, and NPS) lynx coordination effort was initiated in response to the emerging awareness of the uncertain status of lynx populations and habitat in the conterminous United States and the onset of the listing process. The Canada lynx was listed on March 24, 2000 (65 Federal Register 16052), as a threatened species under the Endangered Species Act 1973 in 14 of the lower 48 states. The final lynx listing rule (Clark 2000) gives population and habitat status on a national scale.

The USDA Forest Service (2007) finalized the Northern Rockies Lynx Management Direction (NRLMD) in 2007 which is based upon the LCAS strategy. This decision amends the Forest Plans by providing lynx habitat management objectives, standards, and guidelines. It is being carried forward in all alternatives. The most recent lynx distinct population segment status is found in the Biological Opinion on the effects of the NRLMD (USDI Fish and Wildlife Service 2007a). Additional information is located in the various references cited. On September 12, 2005, the USFWS released a recovery outline for the contiguous United States Distinct Population segment of Canada lynx. This recovery outline categorized and identified three types of lynx habitat; core areas, secondary areas, and peripheral areas. Two out of three of these types: 1) core areas (northwestern Montana/northeastern Idaho); and 2) secondary areas (northern/central Idaho (north of the Salmon River) were identified in the Northern Region (R1) of the Forest Service. No peripheral areas were identified in Region 1 (USDI Fish and Wildlife Service 2005). Only the northeast corner of the IPNF is identified as core habitat and the remainder of the Forest sis considered secondary habitat. Approximately 47 percent of the IPNF is considered lynx habitat, all of which is considered occupied (table C-1 in USDA 2007).

Canada lynx in the IPNF are in the Northern Rocky Mountains GA. Lynx populations in the IPNF are currently unknown.

The USFWS released their revised, final designation of critical habitat for Canada lynx on February 25, 2009 (USDI Fish and Wildlife Service 2009a). A small portion of the IPNFs lynx habitat north of U.S. Highway 2 and east of the Moyie River is in critical lynx habitat.

Habitat and Life History Needs

Lynx in the contiguous United States are at the southern limits of a widely distributed range across Canada and Alaska. Lynx and lynx habitat are most abundant in the classic boreal forest ecosystem known as taiga in Canada and Alaska. Lynx extend south from this into the conterminous United States in a peninsular fashion and inhabit areas that are considered more marginal. Lynx occur primarily in moist, cold habitat types above 4,000 feet in elevation, where snow depths are generally deep throughout the winter. The further south one moves, the less suitable and less abundant habitats become.

Lynx occur in mesic boreal forests that have cold, snowy winters and provide a prey base of snowshoe hares. Lynx usually use mature and late-successional forests where there are accumulations of down logs for denning (IDFG 2005, Koehler and Aubry 1994, and Ruggiero et al. 2000). Other key habitat features appear to be remote and secure habitats, and habitat connectivity (Claar et al. 2003, Koehler and Aubry 1994, Wisdom et al. 2000).

In the United States, lynx inhabit conifer and conifer-hardwood habitats that support their primary (snowshoe hare) and secondary prey. They are adapted for hunting snowshoe hares and other prey in the deep snow conditions of boreal forests (Koehler and Aubry 1994, Ruggiero et al. 2000, and USDI Fish and Wildlife Service 2005).

Snowshoe hare is an important food source, comprising 35 to 97 percent of the diet throughout the range of lynx. In periods of low snowshoe hare densities, starvation can account for up to two-thirds of all natural lynx mortality. Other prey species include red squirrel, northern flying squirrel, grouse, marten, voles, and occasionally small birds. The primary limiting factor for this species appears to be suitable winter foraging habitat. Primary winter foraging habitat is found in multi-story mature or late-successional forests that hold good populations of snowshoe hare (Squires et al. 2006). Recent research in northwest Montana demonstrates that mature, multi-storied forests provide important winter snowshoe hare habitat and are more important than younger stands (USDA 2007). Red squirrels may be an important prey species, especially when hare populations are low. Ongoing research in northwest Montana is identifying which types of stands support snowshoe hares in a high enough density to support lynx populations.

Lynx primarily use multi-story stands in the spruce-fir types during winter as these contain a high amount of horizontal cover and therefore snowshoe hare habitat (Squires et al. 2010). Lynx will also use other stand types during the year, and snowshoe hare appear to occur in an array of stands as long as they provide abundant horizontal cover.

Summer foraging habitat (also good summer hare habitat) consists of early successional stages of dense, young (approximately 17 to 40-year old) forests. This short time-frame (about 23 years) does not last long on the landscape before growing into a structure that does not provide good foraging for lynx. A regular influx of early successional vegetation is important to maintain a level of summer foraging habitat through time. This can be created by any disturbance process, such as fire, windthrow, or vegetation management activities. Generally, maintaining no more than 30 percent of a lynx home range in early succession habitat is considered good for lynx management.

Denning habitat generally consists of mature stands of spruce-fir forests with high horizontal cover and abundant coarse woody debris (Squires et al. 2008). Lynx with kittens need well-distributed patches of denning habitat throughout their home range.

Both timber harvest and natural disturbance processes, including fire, insect infestations, wind events, and tree disease outbreaks can provide foraging habitat when resulting in high understory tree stem densities and structure. These vegetation characteristics provide dense, multi-layered, horizontal vegetation cover that maximizes cover and browse for snowshoe hare at or above the ground, and the mean snow level throughout the winter (Koehler and Aubry 1994, Ruggiero et al. 2000, and USDI Fish and Wildlife Service 2005).

Risk Factors Affecting Canada Lynx

The LCAS (Ruediger et al. 2000) identified specific risk factors to lynx. Table 40 itemizes these in relationship to lynx productivity, mortality, and movements.

Table 40. Risk Factors Potentially Affecting Canada Lynx

Canada Lynx Population Parameters of Concern			
	Productivity	**Mortality**	**Movements**
Risk Factors	Conversion or Alternation of Native Plant Communities	Highways & Associated Collisions	Highways and Associated Developments
	Fire Suppression & Hazardous Fuels Reduction	Trapping	Private Land Development
	Precommercial Thinning	Predator Control Activities	
	Timber Harvest	Shooting	
	Recreational Use	Predation by Other Species	
	Roads and Trails		
	Grazing		

Source: Ruediger et al. 2000

These factors have varying effects on lynx, depending upon the nature, location, duration and timing of the activity (USDI Fish and Wildlife Service 2007a). Some present more likelihood of risks to lynx, others are relatively benign in effects.

Productivity: Conversion of native plant communities, fire suppression and hazardous fuels reduction, precommercial thinning, and timber management may result in effects to prey species and alter the abundance and/or availability of denning habitat and foraging habitat.

According to the LCAS, there is no compelling evidence to suggest management of forest/backcountry road and trail density is necessary to conserve lynx (Ruediger et al. 2000). The LCAS suggests that roads and trails may facilitate snowmobile and other human uses in winter time, allowing competing carnivores access into lynx habitat. However, the NRLMD (USDA Forest Service 2007) and Kolbe (2007) asserts that there is no conclusive evidence to indicate that compacted snow routes increase competition from other species to levels that adversely affect lynx populations. Access via roads may also increase the mortality risk to lynx from incidental trapping - a significant source of mortality for lynx in areas where lynx are legally trapped (Canada and Alaska) (Koehler and Aubry 1994).

Grazing by livestock and/or wild ungulates may increase forage competition with lynx prey or alter the native plant communities that may reduce the quantity and/or quality of snowshoe hare habitat.

Mortality: Major high use highways such as Interstate 90 (I-90), State Route 95 (SR-95), and SR-200 may result in lynx mortalities of both resident and dispersing individuals through vehicle collisions (Ruediger et al. 2000).

The states of Idaho, Montana, and Washington prohibit trapping of lynx; however, legal trapping of other species occurs in these three states. This includes predator control of the recently delisted gray wolf[1], where the 2011-2012 hunting season saw an increase in trapping and snaring. Both trapping and snaring have the potential to kill non-target species such lynx. Conversely, British Columbia has a legal trapping season for Canada lynx north of IPNF boundary. Some lynx home ranges overlap this international border and are at risk from this potential source of mortality.

Big game hunting is legal throughout NFS lands within the action area and lynx may occasionally be shot during the hunting season. Predation by mountain lions and wolves may be a source of mortality in some locations.

Movement: Major highways and associated development within rights-of-way may also affect movement by lynx (Ruediger et al. 2000). Although empirical data are limited, anecdotal observations of radio-collared lynx indicate they have crossed divided interstate and secondary highways. However, it is not understood how highways and associated development may impact population connectivity. The highways that may have the highest potential of impacting lynx include SR-95 and I-90. Private land development, especially along road corridors in mountain valleys, may also fragment habitat and impede movement of lynx (Ruediger et al. 2000).

Lynx Analysis Units (LAUs), Designated Critical Habitat and Available Habitat

LAUs: Upon listing, lynx habitat management on Federal lands was guided by the Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000). The LCAS directed agencies to delineate Lynx Analysis Units (LAUs) which are intended to provide the fundamental unit for evaluating and monitoring the effects of management activities on lynx. A LAU is about the size of a female lynx home range (USDA Forest Service 2007), and should generally be between 16,000 – 32,000 acres (25-50 square miles) in size with at least 6,400 acres

[1] The gray wolf was delisted in 2011 (U.S. Fish and Wildlife Service 2011).

of primary habitat. Thirty-five LAUs are delineated on IPNF, with the majority of habitat located on the Priest Lake, Sandpoint, and Bonners Ferry Ranger Districts.

Designated Critical Habitat: The IPNF analysis area partially falls in designated critical lynx habitat within the Rocky Mountain critical habitat unit (USDI Fish and Wildlife Service 2009a). This includes approximately 34,650 acres of designated critical habitat located north of U.S. Highway 2 and east of the Moyie River in the extreme northeast corner of the IPNF.

The physical and biological features that are essential to the conservation of the species have been identified within the geographical area occupied by the lynx at the time of listing. These physical and biological features are the primary constituent elements (PCEs) laid out in a specific quantity and spatial arrangement to be essential to the conservation of the species. Based on this and the current knowledge of the life history, biology and ecology of the species, the PCE for lynx critical habitat is defined as boreal forest landscapes supporting a mosaic of differing successional forest stages and containing the following:

- Presence of snowshoe hares and their preferred habitat conditions, which include dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface;
- Winter snow conditions that are generally deep and fluffy for extended periods of time;
- Sites for denning that have abundant coarse woody debris, such as downed trees and root wads; and
- Matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range.

Available Habitat: As the available knowledge of lynx habitat requirements has increased, lynx habitat in North Idaho has been more narrowly defined to include only subalpine fir/Engelmann spruce habitats (primary habitat except on the Priest Lake RD, where moist cedar-hemlock is also considered primary vegetation) and cool/moist habitat types occurring adjacent to primary habitat to create a transition between lynx habitat and non-lynx habitat. Based on research findings, the distance agreed upon by the IPNF and the Canada Lynx Biology Team for this transition zone is generally limited to secondary habitat within 200 meters of primary habitat. Table 41 displays the amount of primary, secondary[1], and critical habitat[2] available by LAU across the IPNF. A total of 582,979 acres of occupied lynx habitat occurs on the IPNF. This figure updates the values in the NRLMD (USDA Forest Service 2007) and associated BO (USDI Fish and Wildlife Service 2007a).

[1] While primary and secondary habitat is differentiated in the tables in this section they will be referred to as ‘potential lynx habitat’ or ‘lynx habitat’ collectively throughout the remainder of the “Terrestrial Wildlife” section.
[2] Critical habitat is a combination of primary and secondary habitat.

Table 41. Lynx Analysis Units (LAUs), Total Size, Amount of Private/State Land and Potential Lynx Habitat on the IPNF, 2012

Lynx Analysis Unit(LAU)	Total Size of LAU (Acres)	Private & State Lands (Acres/% of Total)	Idaho Panhandle National Forests Potential Lynx Habitat (Acres)			
			Primary	Secondary	Critical	Total
American-Canuck	24,610	0	-	-	20,710	20,710
Blue-Grass	25,709	224 (<1)	13,135	5,118	0	18,253
Boulder	17,380	0	11,983	2,238	0	14,221
Cascade	22,403	1	12,889	2,640	0	15,529
Copper Ruby	19,768	0	6,532	4,245	0	10,777
Deer-Skin	23,092	0	-	-	13,977	13,976
Five Lakes Butte	18,997	0	7,795	4,245	0	12,040
Fly Mosquito	28,767	911 (3%)	6,322	8,174	0	14,496
Gold Creek	27,352	0	6,657	9,396	0	16,053
Grouse	15,868	39	9,492	2,828		12,320
Hemlock	28,750	0	27,006	153	0	27,159
Hughes	20,592	0	19,569	65	0	19,634
Kalispell	24,744	94 (<1%)	22,043	351	0	22,394
Katka	17,750	0	6,525	3,237	0	9,762
Lightning	23,758	0	13,760	2,242	0	16,002
Little North Fork	38,316	3,330 (9%)	9,973	9,890	0	19,863
Lunch	17,100	0	11,184	3,554	0	14,738
Pack River	18,660	0	7,793	2,714	0	10,507
Parker	22,856	0	13,693	2,085	0	15,778
Red Ives	20,711	0	7,823	6,247	0	14,070
Round-Prairie	39,086	3,814 (10%)	9,831	4,226	0	14,062
Saddle-Cow	27,154	0	12,021	4,593	0	16,614
Sawtooth Canyon	41,231	7,162 (17%)	6,064	5,803	0	11,867
Scotchman	22,114	74	8,708	1,478	0	10,186
Sema	23,882	3,558 (14%)	17,630	1,533	0	19,163

Lynx Analysis Unit(LAU)	Total Size of LAU (Acres)	Private & State Lands (Acres/% of Total)	Idaho Panhandle National Forests Potential Lynx Habitat (Acres)			
			Primary	Secondary	Critical	Total
Simmons	24,972	0	8,034	7,539	0	15,573
Snow	25,752	3,162 (13%)	11,907	3,300	0	15,207
St. Joe Headwaters	19,736	0	8,975	6,124	0	15,099
Stateline Quartz	39,278	484 (1%)	6,574	10,385	0	16,959
Tola-Pelke	16,463	532 (3%)	13,767	35	0	13,802
Trestle	31,560	0	12,986	5,139	0	18,125
Trout	24,083	0	15,350	2,603	0	17,953
Upper Priest	33,571	100 (3%)	29,521	588	0	30,109
Upper Smith	28,562	2,658 (9%)	13,958	3,475	0	17,434
Willow	37,074	306 (<1%)	30,347	2,199	0	32,546
Total	**891,701**	**26,449**	**419,852**	**128,442**	**34,687**	**582,981**

Linkage Areas

Lynx linkage areas have been identified (Claar et al. 2003, USDA 2007) and are intended to maintain connectivity and allow for movement of animals between blocks of habitat that are otherwise separated by intervening non-habitat areas such as basins, valleys and agricultural lands, or where habitat naturally narrows due to topographic features. There are several (8) identified linkage areas (Claar et al. 2003, USDA 2007) for lynx in the analysis area. All eight of these are located on private lands (and non-lynx habitat) in valley bottoms and transect interstate or state highways (i.e., Interstate 90 (I-90), State Route 95 (SR 95), SR 200, and SR 2). None of these are located in critical habitat, although one provides potential linkage from critical habitat southward to other primary lynx habitat.

Current Management for Canada Lynx

Currently, management of lynx habitat on the IPNF is dictated by the 1987 Forest Plan (USDA Forest Service 1987) MA direction, the 2008 IRR, and the 2007 amendment to the plan with completion of the NRLMD (USDA Forest Service 2007). Tables 42 and 43 disclose the existing distribution under the 1987 Plan MA direction and the allowable activities and uses within identified capable lynx habitat per the 1987 Plan MA direction and the 2008 IRR. Additionally, 60 percent of capable lynx habitat overlaps with BMUs. The design elements in the Access Amendment (USDA Forest Service 2011b and 2011c) provide additional direction and limits in regards to motorized access for grizzly bears that may affect lynx habitat.

Table 42. Potential Lynx Habitat on NFS Lands by Existing (i.e., 1987 Forest Plan) Management Area Direction

Existing Condition (1987 Forest Plan) Management Areas (MAs)	Potential Lynx Habitat (Acres)			
	Primary	Secondary	Critical[1]	Total[2]
1 - Timber Production	70,591	31,712	5,170	107,474
2 - Timber Production within Grizzly Bear habitat	38,505	13,756	17,836	70,097
3 - Timber Production in Grizzly Bear & Big	2,967	24	0	2,990
4 - Timber Production within Big Game Winter	27,130	2,345	0	29,475
5 - Big Game Winter Range	103	115	0	218
6 - Timber Production within Elk Summer Range	11,255	12,203	0	23,458
7 - Caribou Management	74,578	19,190	0	93,769
9 - Non-Forest lands, lands non-suited	47,528	12,446	10,911	70,884
10 - Semi-primitive Recreation	45,793	9,293	0	55,086
11 - Existing and Proposed Wilderness	70,637	18,161	0	88,798
12 - Wild and Scenic River Systems	11,149	3,787	0	14,936
13 - Special Interest Areas	2,635	0	733	3,367
14 - RNA	2,208	341	0	2,549
15 - Primary Range[3]	0	0	0	0
16 – Riparian[3]	0	0	0	0
17 - Developed Recreation Sites	0	0	0	0
18 - Administrative Sites[3]	0	0	0	0
19 - Semi-primitive/Timber Production	11,421	2,292	0	13,713
20 - Semi-primitive unroaded with limited timber	2,951	2,639	0	5,590
Total	**419,450**	**128,305**	**34,649**	**582,404**

[1] Critical habitat (CH) is composed of primary and secondary habitats
[2] Total acres of primary, secondary, and critical habitats
[3] Not mapped as an MA

Table 43. Potential Lynx Habitat by Allowable Uses and Activities under existing (1987 Forest Plan) Management Area direction and the Idaho Roadless Rule (2008)

Allowable Uses Under the Current Forest Plan Management Area Direction	Lynx Habitat Acres (% of Total[1])	Critical Habitat Acres (% of all CH[2])
Timber Harvest	431,160 (79)	33,917 (98)(
Timber Production	114,276 (21)	23,009 (66)
Commercial Use – Special Forest Products & Firewood	547,755 (100)	34,649 (100)
Personal Use – Special Forest Products & Firewood	547,755 (100)	34,649 (100)
Planned Fire Ignition	542,571 (99)	33,916 (98)
Natural, Unplanned Fire Ignitions to meet Resource Objectives	88,798 (16)	0 (0)
Grazing	444,021 (81)	34,649 (100)
Motor Vehicle	459,567 (83%)	34,649[5] (100)
Over-snow Motor Vehicle	489,260 (89%)	34,649[5] (100)
Road Construction (permanent or temporary)	386,540 (71)	36,649 (100)
Minerals – Leasable	277,307 (51)	16,081 (46)
Minerals - Materials	490,120 (90)	33,916 (98)

The magnitude of actual use and activity is regulated by the 2007 NRLMD standards and guidelines (USDA Forest Service 2007) as well as other management direction and available budgets

[1] Total of all potential lynx habitat other than critical habitat≈548,294 acres

[2] Total Lynx critical habitat≈34,687 acres

The 1987 Forest Plan was amended to incorporate direction from the 2007 NRLMD. The NRLMD was intended to address the major threats to lynx and the inadequacy of existing regulatory mechanisms in order to reduce adverse effects and avoid jeopardy through its implementation. The NRLMD applies to all management actions in lynx habitat in LAUs in occupied habitat and in linkage areas (USDA Forest Service 2007). The primary issues addressed in the NRLMD included winter snowshoe hare habitat in multistoried forests, wildand fire risk, over-snow recreation, and the nature of management direction applied to grazing, mineral development, roads, and over-snow recreation. To that end, the NRLMD provided a series of general planning objectives, standards, and guidelines for each of 15 identified risk factors (denning habitat, foraging habitat, habitat conversions, vegetation thinning, fire management, landscape patterns, road management, develop recreation, non-winter recreation, winter recreation, minerals, connectivity, land adjustments, coordination, and monitoring) (USDI Fish and Wildlife Service 2007a).

Specific management direction was provided for five categories including: 1) All management practices and activities; 2) vegetation management activities and practices; 3) livestock management; 4) human use (i.e., special uses, recreation, road, highways, mineral and energy development); and 5) linkage[1] areas (USDA Forest Service 2007, and appendix D). This direction is carried forward into the Proposed Action. Key standards include:

[1] Linkage areas are places that connect blocks of lynx habitat. Eight (check) linkage areas were identified within the IPNF action area (USDA Forest Service 2007).

- New or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area (Standard ALL S1);
- Changes in LAU boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office (Standard LAU S1);
- If more than 30 percent of the lynx habitat in a LAU is currently in stand initiation structural stages that does not yet provide winter snowshoe hare habitat (formerly called “unsuitable”), no additional habitat may be regenerated by vegetation management projects. There is an exception to this standard for fuels treatment projects within the wildland urban interface (WUI)[1] (Standard VEG S1);
- Timber management projects shall not regenerate more than 15 percent of lynx habitat on NFS lands within a LAU in a ten year period (Standard VEG S2). There is an exception to this standard for fuels treatment projects within the WUI;
- Precommercial thinning of lynx habitat is generally not allowed, but there are exceptions for fuels treatment projects within the WUI3 or other resource benefit (e.g., whitebark pine restoration) (Standard VEG S5); and
- Vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late-successional forests are prohibited except for treatment around administrative sites[2], for research studies, or for incidental removal during salvage harvest (Standard VEG S6).

The NRLMD applies to all management actions in occupied lynx habitat in LAUs and linkage areas (USDA Forest Service 2007). This includes critical habitat which was designated after completion of the NRLMD. Two LAUs located on the IPNF have designated critical habitat per the 2009 final rule (table 4). This includes all potential lynx habitat located in the American-Canuck and Deer-Skin LAUs.

The 2009 final rule described three types of actions that may adversely affect critical habitat. Briefly, these are:

- Actions that would reduce or remove understory vegetation within boreal forest stands on a scale proportionate to the large landscape used by lynx….These activities could significantly reduce the quality of snowshoe hare habitat such that the landscape’s ability to produce adequate densities of snowshoe hares to support persistent lynx populations is at least temporarily diminished;
- Actions that would cause permanent loss or conversion of the boreal forest on a scale proportionate to the large landscape used by lynx….Such activities could eliminate and fragment lynx and snowshoe hare habitat; and
- Actions that would increase traffic volume and speed on roads that divide lynx critical habitat….These activities could reduce connectivity within the boreal landscape for lynx, and could result in increased mortality of lynx.

Although the NRLMD did not specifically address lynx critical habitat, it does contain direction that contribute to the maintenance of the lynx PCEs of critical habitat. Table 44 lists the NRLMD components and which PCE they address.

[1] Please see appendix C for an update of the number of acres that can be treated under this exception on the IPNF

[2] Administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements including infrastructure within permitted ski are boundaries (appendix D—glossary terms).

Table 44. NRLMD Components that Address Canada lynx Primary Constituent Elements of Critical Habitat.

Canada Lynx Primary Constituent Elements (PCEs)	Northern Rockies Lynx Management Direction Applicable Objectives, Standards, and Guidelines
Snowshoe Hare Populations/Hare Habitat	ALL O1, S1; VEG O1-O4; VEG S1-S6; VEG G1, G5, G10; GRAZ O1, G1; HU G01, G02, G05, and G08
Denning	VEG G11
Matrix	VEG G5; GRAZ G2-G4

Although the NRLMD pre-dates the designation of critical habitat, it maintains and addresses those habitat features that make up the PCE. It maintains the vegetation components of lynx habitat, particularly those habitats that provide for snowshoe hares. Direction for providing denning habitat is also included in the NRLMD. Matrix habitat is not specifically mentioned in the NRLMD objectives, standards, or guidelines. However, there is direction in the NRLMD related to habitat components that could be considered matrix habitat. There is direction related to linkage areas, grazing, hardwoods/shrubs, shrub-steppe, providing alternative prey, and using fire to restore ecological processes to maintain lynx habitat. This direction combines to maintain/improve not only lynx habitat where snowshoe hares would occur, but also the interconnecting “matrix” habitat as well.

Past and Ongoing Impacts Associated with Key Stressors

Timber Harvest: Table 45[1] is a summary of the current condition of IPNF LAUs in regards to percentage of habitat in the stand initiation stage and how timber management (via regeneration harvest) contributed to the acres of stand initiation stage over the last 10 years (2002-2011). It also includes the number of adjacent LAUs that exceed the 30 percent stand initiation standard. On the IPNF, there are no LAUs that exceed the 30 percent requirement, and the Forest has not regenerated more than 15 percent of any LAU over the past 10 years.

[1] Timber harvest associated with fuels treatments in the WUI is included in this table. Table 1 (appendix C) discloses the acres of lynx habitat by LAU that is located within the WUI (total=102,000 acres). Six percent of the total acres of lynx habitat =34,978 acres of fuels treatment allowed under the NRLMD. This figure updates the values in the NRLMD (USDA Forest Service 2007) and associated BO (appendix E, USDI Fish and Wildlife Service 2007a).

Table 45. Status of Potential Lynx Habitat on NFS Lands, by LAU, in a Stand Initiation Stage of Development, 2011

Lynx Analysis Unit (LAU)	Potential Lynx Habitat in LAUs on NFS Lands (Acres)	Stand Initiation Structural Stage Habitat (NFS Lands) (Acres (%))[1]	Habitat Changed to Stand Initiation Structural Stage Over Past 10 Years by Timber Management with Regeneration Harvests (NFS Lands) (Acres (%))[2]	Number of Adjacent LAUs that Exceed 30 % Lynx Habitat in a Stand Initiation Structural Stage
American-Canuck	20,710	1,034 (4.9)	183 (0.9)	0
Blue-Grass	18,253	225 (1.2)	102 (0.6)	0
Boulder	14,221	95 (0.7)	0	0
Cascade	15,529	208 (1.3)	88 (0.6)	0
Copper-Ruby	10,777	0	0	0
Deer-Skin	13,976	28 (0.2)	0	0
Five Lakes Butte	12,040	0	0	0
Fly Mosquito	14,496	244 (1.7)	45 (0.3)	0
Gold Creek	16,053	174 (1.1)	0	0
Grouse	12,320	5 (<.1)	0	0
Hemlock	27,159	952 (3.5)	0	0
Hughes	19,634	820 (4.2)	0	0
Kalispell	22,394	55 (0.2)	0	0
Katka	9,762	77 (0.8)	0	0
Lightning	16,002	503 (3.1)	0	0
Little North Fork	19,863	145 (0.7)	0	0
Lunch	14,738	157 (1.1)	0	0
Pack River	10,507	36 (0.3)	0	0
Parker	15,778	17 (0.1)	0	0
Red Ives	14,070	54 (0.4)	0	0
Round-Prairie	14,062	663 (4.7)	276 (1.9)	0
Saddle-Cow	16,614	147 (0.9)	106 (0.6)	0
Sawtooth Canyon	11,867	158 (1.3)	0	0

Lynx Analysis Unit (LAU)	Potential Lynx Habitat in LAUs on NFS Lands (Acres)	Stand Initiation Structural Stage Habitat (NFS Lands) (Acres (%))[1]	Habitat Changed to Stand Initiation Structural Stage Over Past 10 Years by Timber Management with Regeneration Harvests (NFS Lands) (Acres (%))[2]	Number of Adjacent LAUs that Exceed 30 % Lynx Habitat in a Stand Initiation Structural Stage
Scotchman	10,186	3 (<.1)	0	0
Sema	19,163	18 (<.1)	0	0
Simmons	15,573	558 (3.6)	0	0
Snow	15,207	0	0	0
St. Joe Headwaters	15,099	901 (5.9)	0	0
Stateline Quartz	16,959	638 (3.8)	494 (2.9)	0
Tola-Pelke	13,802	124 (0.9)	0	0
Trestle	18,125	96 (0.5)	0	0
Trout	17,953	129 (0.7)	0	0
Upper Priest	30,109	2,309 (7.7)	0	0
Upper Smith	17,434	592 (3.4)	0	0
Willow	32,546	48 (0.2)	0	0
Totals	582,981	11,213	1,294	0

[1] Lynx habitat in a stand initiation structural stage not yet providing winter snowshoe hare habitat (typically less than 16 years after treatment)

[2] Regeneration harvest includes clearcutting, shelterwood, seed-tree, single-tree, and group selection

Precommercial Thinning: Since finalization of the NRLMD in 2007, the IPNF has made decisions on three projects involving precommercial thinning in lynx habitat. A total of 717 acres of lynx habitat in five LAUs were affected with project implementation. These projects involved exclusions to Standard VEG S5 for treatment of white pine and restoration of whitebark pine.

Based on the remapping of lynx habitat, the IPNF projects up to 17,120[1] acres of precommerical thinning could occur within occupied lynx habitat over the next 15 years.

Unplanned and Planned Fire Ignitions: Since the Canada lynx was listed in 2000, 1,681 wildfire events have burned approximately 24,640 acres across the Forest. Five hundred of these events occurred within LAUs and burned approximately 13,180 acres within the LAU boundary. Approximately 1,585 acres of this occurred in critical habitat in the American-Canuck LAU. Since completion of the NRLMD in 2007, the IPNF has completed 1,342 planned prescribed burns covering 46,977 acres, with 144 of these operations burning approximately 4,330 acres within LAUs. None of these ignitions were located in designated critical habitat.

Roads, Highways, and Over-snow Routes and Play Areas: Table 46 summarizes existing motorized access within LAUs on the IPNF.

Table 46. Current Motorized Access within Identified Canada Lynx Habitat on the IPNF

Type of Allowed Access	NFS Lands within LAUs	
	Non-Critical LAUs[1]	Critical Habitat LAUs[2]
Motorized Access Routes (miles)[3]	531	62
Highways (miles)	0	0
Over-snow Motorized Use (acres)[4]	249,727	34,649
Designated Over-snow Play Areas (acres)	0	0
Groomed Over-snow Routes (miles)	123	6

[1] Blue-Grass, Boulder, Cascade, Copper-Ruby, Five Lakes Butte, Fly Mosquito, Gold Creek, Grouse, Hemlock, Hughes, Kalispell, Katka, Lightning, Little North Fork, Lunch, Pack River, Parker, Red Ives, round-Prairie, Saddle-Cow, Sawtooth Canyon, Scotchman, Sema, Sentinel, Simmons, Snow, St. Joe Headwaters, Stateline Quartz, Tola-Pelke, Trestle, Trout, Upper Priest, Upper Smith, Willow

[2] American-Canuck and Deer-Skin LAUs

[3] Some of these miles of motorized routes are located behind gates in the grizzly bear recovery zones

[4] Many of these areas have limited accessibility for snowmobiling off-route due to tree densities and topography

Recent efforts to complete Motorized Vehicle User Maps (MVUM) on the IPNF closed overland motorized travel and resulted in a reduction of motorized routes available throughout the action area. In addition, there are no downhill ski areas[2] located in lynx habitat on the IPNF.

A large portion of the recovery area for Canada lynx is also within the recovery zones for grizzly bear and caribou on the IPNFs. Canada lynx are afforded the security provided for bears and caribou in these areas. Controlling and/or managing motor vehicle access in grizzly bear and caribou habitat may be compatible with Canada lynx use by reducing the risk of displacement and other human effects. Most of the Selkirk, Purcell, and Cabinet Mountains LAUs in the northern part of the action area are currently included in the Grizzly Bear Recovery Zones and are influenced by the restrictions placed on motorized access (see page 74, Grizzly bear, for

[1] Represents thinning for research, defensible space, and white pine/whitebark pine/aspen treatments. This updates table 1, appendix D of the NRLMD Biological Opinion (USDI Fish and Wildlife Service 2007a).
[2] Lookout ski area is located on the IPNF but none of it is located within lynx habitat on the Forest.

details). Additionally, much of the Selkirk Mountains LAUs are closed to over-snow motorized use due to a 2007 federal court order to protect woodland caribou (see page 123, Woodland caribou, for details). This later closure will remain in place until the IPNF completes a Winter Travel Plan that addresses motorized over-snow travel in the Selkirk Mountains at some time in the next two-to-four years. The acreages in table 46 include this closure as part of the existing environmental baseline.

Livestock Grazing: In 1979, there were 73 allotments on the IPNF with the majority of forage produced on 7,500 acres of meadow and permanent grasslands. The 1987 IPNF Forest Plan permitted livestock use to be 6,700 Animal Unit Months (AUMs). However, cattle's grazing has been declining on the Forest, with an average of only 3,086 AUMs from 1996 through 2009. Today there are only 14 allotments on the Forest with a total of 2,375 AUMs. This decline can be attributed to the re-growth of trees on transitory range, changing patterns of private lands use, and rising industry costs that make small allotments uneconomical (see the "Range" section of Chapter 3 of the FEIS)

There are three cattle grazing allotments covering 10,177 acres of lynx habitat in three LAUs within the IPNF Proposed Action area. None of these allotments are located in designated critical habitat.

Minerals (Locatable and Materials): There are currently 1,232 Plans of Operations for locatable minerals on the IPNF. Of these, 13 are located in lynx habitat and one is located in critical habitat. The majority of on-going activities are related to maintenance of existing facilities. Most locatable mineral operations are less than five acres in size. Potential for future mineral discovery is considered "low."

There are approximately 434 active mineral material pits within the IPNF and of these 23 sites are within lynx habitat and another five are located in designated critical habitat. Sites typically range from less than one to five acres in size.

There are no leasable minerals located on the IPNF at this time.

Other On-Going Activities within the Project Area

Recreational Activities: The IPNF is easily accessed and has a growing and changing visitor base. Most of the visitation is local with strong ties to the Forest. Traditional uses include hiking, hunting, fishing, gathering, biking, water-based camping, and boating. Winter activities are snow dependent and focus on snowmobiling.

Outdoor recreation is the fastest growing use within the national forest and it is a use that is expected to increase in the future. Since the 1980, both motorized and non-motorized recreation use of the roads, trails, and general forest areas have increased. Foot, horse, and mountain bike travel have increased, and to a lesser degree, cross-country and backcountry skiing receive use as well.

Hunting in the United States and Canada: The province of British Columbia and the states[1] of Montana, Idaho, and Washington continue to allow hunting and trapping of a variety of big game and fur bearer species. Lynx are not legally trapped, but may be incidentally captured during

[1] State fish and game agencies include Montana Fish, Wildlife and Parks, Idaho Department of Fish and Game, and Washington Department of Fish and Wildlife.

trapping for other species, but trapping management is not under the jurisdiction of the Forest Service.

Recreation Special Use Permits (SUPs) and Agreements: Special use authorizations permit occupancy and use on NFS lands by federal, state and local agencies, private industry, and individuals. Recreation special use permits are of particular interest in evaluating effects to lynx due to their proximity to lynx habitat and their potential to generate some level of disturbance or displacement. The IPNF currently has 190 recreation Special Use Permits and agreements (see the “Access and Recreation” section). None of these involve winter recreation. However, there are seven challenge-cost share agreements that permit winter grooming of snowmobile trails on the IPNF, and five of these have some of their operations located within LAUs. None of these are located in critical habitat.

Key Stressors Affecting Canada Lynx

Of the management activities allowed under the Proposed Action, timber harvest, fire management, motorized access on Forest highways, over-snow vehicle use and associated road construction are the key stressors to Canada lynx.

Timber Harvest and Precommercial Thinning: In 2000, the FWS stated that “timber harvest and associated forest management can be benign, beneficial, or detrimental to lynx depending on harvest methods, spatial and temporal specifications, and the inherent vegetation potential of the site” (USDI Fish and Wildlife Service 2000). Even-aged harvest, for example, removes or alters stand structure, and temporarily eliminates snowshoe hare forage/cover and lynx cover until the site is regenerated to forest cover. In addition, this type of treatment reduces potential denning habitat by removing large trees and down logs from the site and reduces prey habitat (i.e. red squirrel) with the removal of large trees. Regeneration harvest can be a tool for creating high quality snowshoe hare habitat in the future, especially where natural regeneration would be expected to respond and provide dense young vegetation. Uneven-aged management, such as single tree selection or group selection, results in varying effects to snowshoe hare, red squirrel and lynx, depending on the stems removed, harvest system and post-sale treatments. This harvest method can be used to replicate or mimic forest gap dynamics. In drier forests, particularly at the southern edge of lynx range, snowshoe hare abundance may exhibit unimodal distribution, with peaks in old growth forests (Buskirk et al. 2000). Harvest in these stands may therefore have greater effects.

Reducing dense horizontal structure within forest stand understories through silvicultural thinning can reduce an area’s carrying capacity for snowshoe hares (Homyack et al. 2007). In northwestern Montana, Ausband and Baty (2005) found that within individual forest stands, hares had a significant affinity for dense, unthinned sapling patches. Research conducted in northwestern Montana found that precommercial thinning decreased snowshoe hare abundance, compared to both control and thinned stands where 80 percent of the entire stand was thinned but 20 percent of the total stand was retained with saplings uncut (Griffin and Mills 2007). Declines were prominent in the second winter after treatment. In addition, estimated survival rates of snowshoe hares decreased as individuals spent proportionately more time in open young and open mature forest stand structure types (Griffin and Mills 2007). Additional research to investigate the relationship of various stand conditions to snowshoe hares is currently underway in several different regions of the western United States.

Vegetation treatments focused on fuel reduction or salvage of dead and dying trees can result in the removal of coarse woody material or negatively affect its recruitment into the stand. This may reduce the areas potential use as denning habitat for lynx—although a lack of denning is not considered a limiting factor across the landscape. Additionally, fuel reduction projects have the potential to reduce or eliminate lynx habitat by simplifying stand structure and/or reducing stem densities below levels that provide suitable forage and cover conditions for snowshoe hares. These activities have the potential to diminish the landscape's ability to produce adequate densities of snowshoe hares to support persistent lynx populations. Both effects are anticipated to be adverse to lynx (USDI Fish and Wildlife Service 2007a).

Fire (natural ignitions, planned ignitions): Fire exclusion has altered the pattern and composition of vegetation within lynx habitat within National Forests in Idaho (Hillis et al. 2003). These patterns, especially within stand replacing fire regimes (predominately spruce-fir communities), were likely important in providing young age class snowshoe hare habitat across the landscape. Planned and unplanned ignitions could be used as a restoration tool for these ecosystems that have been impacted by fire exclusion.

These activities may temporarily reduce the quality of lynx habitat for several years following a burn (Fox 1978), as changes to understory may reduce snowshoe hare populations, remove cover, and possibly increase competition from coyotes in open habitats (Stephenson 1984, Koehler and Brittell 1990). However, in the longer term (10-15 years), areas burned may provide for higher densities of snowshoe hares than prior to treatment, resulting in a benefit to resident lynx.

Most prescribed burning in lynx habitat on the IPNF has been associated with post-harvest treatments although there have been a few landscape prescribed burns in recent years to promote habitat improvement for big game winter range and whitebark pine restoration. Short-term adverse effects to Canada lynx from prescribed fire could occur where implementation overlaps lynx activity in space and time.

Road Construction and Motorized Access: In general, construction and reconstruction of forest roads are not considered a primary threat to resident lynx populations in and of themselves (USDI Fish and Wildlife Service 2000 and 2007). Vehicle speeds on forest roads are relatively slow in comparison to highways or other public roads due to topography, substrate and road conditions. Thus, the potential for lynx mortality or injury due to collisions with vehicles is thought to be low on forest roads. Although recreational, administrative and commercial uses of forest roads are known to disturb many species of wildlife (Ruediger 1996), preliminary information suggests that lynx do not avoid roads (Ruggiero et al. 2000), except at high traffic volumes (Apps 2000). It is possible that summer use of roads and trails through denning habitat may have negative effects if female lynx are forced to move kittens because of associated human disturbance (Ruggiero et al. 2000). While some new road construction continues to occur in some watersheds throughout lynx habitat in the Northern Rockies—and many of these are already highly roaded—the effects on lynx are largely unknown. Access via roads may also increase the mortality risk to lynx from incidental trapping - a significant source of mortality for lynx in areas where lynx are legally trapped (Canada and Alaska) (Koehler and Aubry 1994). Further research directed at investigating the effects of road density on lynx is needed (Ibid).

Motorized Over-snow Access: The primary mechanism through which forest and backcountry roads could negatively impact Canada lynx is through facilitation of winter recreation, such as snowmobiling, cross-country skiing, or snow-shoeing. These snow-compacting activities may facilitate the movement of competing carnivores, primarily coyotes, along snow compacted routes into lynx habitat during winter. Lynx have very large feet in relation to their body mass, which provides them with a competitive advantage over other carnivores in deep snow conditions. Various reports and anecdotal observations have documented coyotes using high elevation, deep snow areas (Buskirk et al. 2000). Research conducted in central Alberta, attributed the use of more open habitats by coyotes to greater snow compaction (Todd et al. 1981). In another study in Alberta, coyotes were more selective of hard or shallow snow conditions than lynx (Murray et al. 1994). Over-snow motorized access may also increase the mortality risk to lynx from incidental trapping - a significant source of mortality for lynx in areas where lynx are legally trapped (Canada and Alaska) (Koehler and Aubry 1994).

Kolbe monitored coyotes over three winter seasons within lynx habitat in northwestern Montana to assess how coyotes interacted with compacted snowmobile trails (Kolbe 2005, Kolbe et al. 2007). Coyotes remained in lynx habitat having deep snow conditions and traveled on compacted snowmobile trails more than random expectations. However, coyotes used compacted snowmobile trails for less than eight percent or their travel and used compacted and un-compacted roads similarly (Kolbe et al. 2007). Coyotes did strongly select for shallower and more supportive snow surfaces when traveling off of compacted trails. In this study, coyotes primarily scavenged ungulate carrion that was readily available during winter months, while snowshoe hare kills comprised only three percent of coyote feeding sites (Ibid). Kolbe (2005) concluded that there is no conclusive evidence to indicate that compacted snow routes increased competition from other species to levels that adversely affected lynx populations. In their BO for the NRLMD, the FWS stated, “The best information available has not indicated that compacted snow routes increase competition from other species to levels that adversely impact lynx populations, and under the [NRLMD], the amount of areas affected by snow compacted routes within the NRLA would not substantially increase. Thus the [NRLMD] would allow projects that may adversely affect individual lynx in some specific cases, however the [NRLMD] as a whole would avoid appreciable reductions in the reproduction, numbers, and distribution of lynx in core areas and all occupied habitat, and in the NRLA area” (USDI Fish and Wildlife Service 2007a).

Although lynx are generally tolerant of human presence, disturbance may be great enough to cause displacement of individual cats in some circumstances.

Mineral Extraction Activities: Generally, the impacts of mining on terrestrial wildlife species, including Canada lynx, result from the habitat loss and degradation from the footprint of the mining operation, required infrastructure (i.e., road construction and development), and the human disturbance where individuals are displaced from key habitats. All of these activities result in a decrease in habitat security for lynx.

There are no major mining operations on the IPNF at this time. Known oil and gas deposits on the IPNF, and geothermal energy potential is very low. As such, little commercial interest in leasing for such resources is anticipated. Future development of locatable minerals is expected to be very limited within the action area. Overall, the risk to lynx and lynx habitats due to all mining activities is expected to be very low.

Livestock Grazing: The NRLMD notes that livestock grazing may change, reduce, or eliminate snowshoe hare habitat in quaking aspen, willows, and riparian areas (USDA Forest Service 2007). In shrub-steppe habitat, grazing may change plant composition where shrubs provide cover and connectivity between blocks of lynx habitat. These effects are likely to be localized since there is no evidence grazing poses a threat to lynx populations as a whole (Ibid).

Other Forest Products: Other Forest Products includes personal and commercial firewood collection, limited personal use permits for such items as rocks and trees, and all other unpermitted use of forest products such as huckleberry or mushroom collection. Generally, the collection of forest products occurs in close proximity to roads and the density of people engaged in this activity diminishes with increasing distance from a road or trail. Disturbance and displacement due to human activity and motorized use would be the main effect from the collection of forest products (see effects from motorized access above).

The primary effect of collection of forest products on lynx habitat would be collection of Christmas trees, boughs, and posts and poles. In its ROD, the Forest Service clarified that under Standard VEG S5, thinning for Christmas trees can occur if winter snowshoe hare habitat is not reduced because, generally these activities are done on an individual tree basis and do not change the characteristics of the habitat (USDA Forest Service 2007).

Environmental Consequences

Effects Related to Key Stressors Under Forest Service Control:

Timber Harvest: The NRLMD applies to the 1987 Forest Plan. Under Alternatives B Modified, C, and D FW-STD-WL-01 would be applicable. The vegetation components of the PCEs of lynx critical habitat would be maintained or improved. In addition to the management direction found in the NRLMD, Alternatives B Modified, C, and D would add another desired condition, FW-DC-WL-01, which provides direction for den sites and would minimize the chance that timber harvest related disturbance at den sites would displace lynx. Additionally, timber harvest would be a tool to achieve the desired conditions for vegetation (FW-DC-VEG-01 through FW-DC-VEG-05, FW-DC-VEG-08, and FW-DC-VEG-11) in the revised Forest Plan and would maintain or improve lynx habitat. Moving conditions towards historic conditions in the lower elevation forests would reduce the chance of a large-scale fire beginning in those non-lynx habitats and moving into lynx habitat. FW-GDL-VEG-03 would retain downed wood, which would be useful for lynx denning habitat.

Fire (planned and unplanned ignitions): The use of fire to restore ecological processes and maintain or improve lynx habitat is included in the NRLMD and applies to the 1987 Plan. Alternative B Modified, C, and D would be consistent with the NRLMD with regard to using fire (implemented through FW-STD-WL-01 in the proposed Plan). The ecosystems in which lynx live are adapted to stand-replacing fires. That is how lynx habitat is rejuvenated over time and how habitat mosaics are created. Lynx have evolved with fire as an integral component in shaping habitat. Although fire removes downed wood and potential downed wood (snags), it also creates downed wood and snags. Generally, denning habitat is not limiting for lynx. However, under a scenario where a key piece of denning habitat may need to be protected from a fire, part of FW-DC-FIRE-03 allows for the suppression of undesirable fires where necessary to protect key resources.

Fire suppression: Fire and fire suppression have had a large impact on the distribution and amount of lynx habitat available on the IPNF. Management under the 1987 Plan includes fire suppression in many instances, but also the use of natural unplanned ignitions (see Fire resource section). Fire suppression leads to changes in the amount and pattern of lynx habitat across the Forest. Fire is a natural disturbance process that plays a large role in determining the quantity and distribution of lynx habitat. Fire suppression has increased the risk of a large-scale disturbance (fire) converting a broad area to unsuitable habitat in one event. The patch size of such an event would likely be larger than what would have been expected historically.

Allowing fire to play a more natural role over time would potentially create smaller scale disturbances and therefore a mosaic of different stand ages/structures contributing to future lynx habitat. Alternatives B Modified, C, and D have FW-DC-FIRE-03 that provides direction to allow the increased role of fire in helping trend vegetation towards desired conditions. Those desired conditions are based on historic conditions where fire was a natural part of the ecosystem. Lynx evolved with those conditions and consequently would have the amounts and arrangements of habitats similar to what they evolved with.

Under the revised Forest Plan there would be varying amounts of predicted active fuels reduction among the action alternatives. Alternative A (current Forest Plan as implemented) would be more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire to restore/maintain habitat. The use of natural, unplanned ignitions (passive restoration) would be more likely in MA1, and Alternative C (165,184 acres) would have the most MA1, followed by B Modified (93,071 acres), and D (92,636 acres), and A (88,798 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (211,776[1] acres) and C (176,921[2] acres) have more than D (280,299[3] acres). Both passive and active restoration, and a general trend towards the desired conditions for vegetation under the proposed Plan, would aid in creating more resilient and sustainable lynx habitat. Passive restoration would be a more realistic option in places such as wilderness areas. Those lower-elevation forests with a greater departure from historic conditions may require active restoration (mechanical treatments) before fire can be reintroduced to those landscapes. The risk of stand-replacing fire over large scales would be reduced under the action alternatives, thereby allowing patch sizes to better approximate historic conditions and maintain heterogeneity of stand conditions. Even where lynx habitat would be within historic conditions, restoring non-lynx habitat to historic conditions would reduce the chance of a large-scale fire starting in the lower-elevation forests and moving into lynx habitat. Implementation of FW-DC-FIRE-03 would be useful to maintain or improve lynx habitat conditions and allow fire to play a more natural role in the ecosystem. Further direction in the revised Plan that supports expanded use of natural, unplanned ignitions and planned ignitions includes: MA1a-DC-VEG-01, MA1a-DC-FIRE-01, MA1a-GDL-FIRE-01 and 02, MA1b-DC-VEG-01, MA1b-DC-FIRE-01, MA1b-GDL-FIRE-01 and 02, MA1c-DC-VEG-01, MA1c-DC-FIRE-01, MA1c-GDL-FIRE-01 and 02, MA1e-DC-VEG-01, MA1e-DC-FIRE-01, MA1e-GDL-FIRE-01 and 02, MA2a-DC-FIRE-1, MA2a-DC-VEG-01, MA2a-GDL-FIRE-01 through 03, MA2b-DC-VEG-01, MA2b-DC-FIRE-01, MA2b-GDL-FIRE-01 through 03,MA5-DC-VEG-01, MA5-DC-FIRE-01, and MA5-GDL-FIRE-01.

Landscape connectivity: Connectivity of lynx habitat is incorporated into the 1987 Plan through the NRLMD. In Alternatives B Modified, C, and D, FW-STD-WL-01 applies the NRLMD. FW-DC-WL-18 and FW-GDL-WL-15 through 17 also provide direction relative to connectivity. Crossing structures would be developed through interagency cooperation and NFS lands around those structures would be managed to maintain their function. The vegetation components of connectivity would be managed according to FW-DC-VEG-01 through FW-DC-VEG-05, FW-DC-VEG-08, FW-DC-VEG-11, FW-GDL-VEG-03, and FW-DC-FIRE-03. In doing so, the arrangement and amount of lynx habitat, and therefore connectivity, would be similar to conditions that lynx evolved with in this ecosystem. Allowing fire to play a more natural role would aid in maintaining or restoring connectivity habitat to what lynx evolved with on the Forest. Geographic Area direction that provides for connectivity within the Forest, and to adjacent land ownerships (including Canada) includes: GA-DC-WL-CDA-03, GA-DC-WL-LK-

[1] This figure includes 6,826 acres of critical habitat.
[2] This figure includes 6,826 acres of critical habitat.
[3] This figure includes 4,955 acres of critical habitat.

01 and 02, GA-DC-WL-PO-01, GA-DC-WL-PR-01 and 03, and GA-DC-WL-SJ-02. Combined, all this direction would provide connectivity within the Forest and to habitats outside the Forest.

Road/trail maintenance and construction: The Motorized Access Management within the Selkirk and Cabinet Yaak Grizzly Bear Recovery Zones EIS and ROD amended the existing Plan (Access Amendment). In Alternatives B Modified, C, and D, FW-STD-WL-02 states that the Access Amendment would be applied. Although this was designed to reduce road related impacts to grizzly bears, benefits would also occur for other species such as lynx. FW-GDL-WL-13 gives direction to retain security habitat for elk, and this would benefit other species such as lynx, providing further security habitat late in the fall for those LAUs located south of Lake Pend Oreille. The security areas for elk would include areas that are not within the grizzly bear recovery zone but may still be lynx habitat, providing further security habitat that may be suitable for lynx across the Forest in the fall. Direction to provide security habitat for lynx and other threatened and endangered species would be found in FW-DC-WL-03. The transportation system on the Forest would be to have minimal impacts on threatened and endangered species, as directed in FW-DC-AR-07. Management Area direction that provides for large remote areas with little human disturbance (wilderness and roadless) include: MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, and MA5-DC-WL-01. Combined, all this direction provides secure habitat for lynx across the Forest.

There would be no difference in the specific roads or trails open to motorized use between the alternatives. The acres available for cross-country motorized use would also not change. There would be a difference in the acreage where roads/trails may be designated for motorized use. Alternatives A (459,567 acres and 34,649 acres of critical habitat) would have the most acres available in that regard, followed by D (433,499 acres and 31,469 critical habitat) B Modified (427,294 acres and 31,570 acres of critical habitat), and C (191,321 acres and 31,570 acres of critical habitat). The acreage available for over-snow vehicle use and mechanized use would be greatest under Alternative A (489,260 acres and 34,649 acres of critical habitat), followed by Alternatives D (439,973 acres and 31,570 acres of critical habitat), B Modified (439,530 acres and 31,570 acres of critical habitat), and C (375,389 acres and 31,570 acres of critical habitat). The acreage available road construction (both temporary and permanent) could occur would be greatest under Alternatives D (439,973 acres and 31,570 acres of critical habitat), followed by B Modified (427,294 acres and 24,744 acres of critical habitat), Alternative A (386,540 acres and 34,649 acres of critical habitat) and C (375,389 acres and 31,570 acres of critical habitat). The more acres available for these type of uses, the greater the chance of disturbance to individual lynx. However, there would be habitat available on the Forest where motorized use would not occur or some uses would be restricted, including wilderness, IRAs, and non-motorized backcountry. Thus lynx would have acres available with less human presence, with the greatest amount under Alternative C, followed by Alternative B Modified, then D and A.

The NRLMD applies to the 1987 Plan and includes direction related to roads and recreation, including snow-compacting activities, which are designed to maintain or improve lynx habitat. In Alternatives B Modified, C, and D, FW-STD-WL-01 states that the NRLMD would be applied.

Recreational use: The direction listed above for road/trail maintenance and construction would also reduce impacts from recreation. Recreational use would be generally dependent on a road and trail system to facilitate access. Although lynx are generally tolerant of human presence, disturbance may be great enough to cause displacement of individual cats in some circumstances. FW-STD-WL-02, MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, and MA5-DC-WL-01 create and maintain large, remote security habitats that are likely to have a lower amount of recreational use due to the difficulties of access. Therefore, areas with lower recreational use would be available across the Forest for lynx to use.

The NRLMD applies to all alternatives (FW-STD-WL-01) and includes direction for limiting the effects of human uses on lynx and their habitats.

Mining: The NRLMD applies to the 1987 Plan and contains direction related to mineral activities in lynx habitat. Alternatives B Modified, C, and D would be consistent with that direction (implemented through FW-STD-WL-01).

FW-DC-WL-03 states that populations of threatened and endangered species trend towards recovery and that habitat would be available on NFS lands for occupation. Den sites would be protected through FW-DC-WL-01. Depending on the individual circumstances, a haul/supply route could have substantial traffic and may impact connectivity. If so, then FW-DC-WL-18 and FW-GDL-WL-15 through 17 would provide direction for maintaining connectivity and applies not only to highways, but also to high-use Forest roads such as a haul/supply routes.

Cumulative Effects

In general, cumulative effects are assessed for the Forest and adjacent lands. The period considered for this analysis is the anticipated life of the Plan, 10-15 years.

All past activities on the Forest has resulted in the current habitat conditions. Those current habitat conditions have multi-storied foraging habitat within HRV. Past timber harvest, fuels reduction, and fire suppression have created conditions that provide the amount of multi-storied foraging habitat that lynx would have evolved with under natural disturbance processes in this landscape. Past vegetation management has additionally created stand-initiation foraging habitat. The small amount of treatment in recent years, coupled with fire suppression, has diminished the amount of new stand-initiation foraging habitat on the Forest, although the more important multi-storied foraging habitat remains within HRV.

All the action alternatives would contribute towards maintaining or improving lynx habitat. Timber harvest occurring on private, State, or Canadian lands may impact the distribution, amount, and quality of lynx habitat and may impact connectivity between NFS lands. The desired conditions for vegetation in the revised Forest Plan and the NRLMD would maintain or improve connectivity for lynx on the IPNF. Critical habitat for lynx was identified on both IPNF and lands in other ownerships, so all owners would have to consider the PCEs of critical habitat. The designation of critical habitat for lynx is currently under reconsideration by the USFWS due to court decision and therefore more critical habitat may be established in the future. This would make little difference on the IPNF because habitat is already managed according to the NRLMD.

The Idaho State wildlife Conservation Strategy would improve habitat for lynx, and when utilized on non-NFS ownerships should complement habitat improvement/maintenance on NFS lands. Lynx is currently included in the conservation strategy and general conservation measures/strategies are listed, including recommendations to maintain snowshoe hare habitat and lynx habitat connectivity.

The desired condition for connectivity in the revised Forest Plan would direct the IPNF (FW-DC-WL-18, FW-GDL-WL-15 through 17) to work with other agencies and landowners when highways are proposed to be constructed or reconstructed to incorporate crossing structures where needed. The Plan would be in compliance with the NRLMD relative to connectivity. This would also aid in maintaining some connectivity between NFS lands as private lands are subdivided in the future. As other land ownerships increase roads to support expanding human populations and recreational needs, the importance of NFS lands to provide connectivity would increase.

Climate change would have the potential to alter the amount and distribution of lynx habitat on the IPNF and adjacent ownerships. Coupled with past fire suppression, climate change can increase the impact of insects and disease and reduce the amount of habitat available for lynx. The desired conditions for vegetation and fire (FW-DC-VEG-01 through 05, FW-DC-VEG-08, FW-DC-VEG-11, and FW-DC-FIRE-03) in the revised Forest Plan would shift vegetation to a more sustainable and resilient condition better able to adapt to climate change. That would make lynx habitat more likely to be sustainable and resilient in the long term as the climate changes. Maintaining connectivity of lynx habitat in the face of climate change may be challenging, but by trending towards the vegetation desired conditions, connectivity would be more likely to persist. Maintaining connectivity is important as distributional shifts are one way species respond to climate change (page 90 in USDA 2010). One of the primary constituent elements (PCE) of lynx critical habitat is light, deep, snow. Climate change may influence the availability of this PCE in the future, and it is outside the control of the IPNF to dictate the location of this PCE on the landscape. This PCE may be located higher in elevation and patches separated by greater distances in the future if the climate become warmer.

Border Patrol activities on the Forest have the potential to cause disturbance through use of roads or trails that are normally closed to motorized use. The exact extent/amount of the impact over the life of the Plan is difficult to predict because many factors could influence the amount and location of Border Patrol activity. Generally speaking, the likelihood of Border Patrol presence increases with decreasing distance from the border.

Past mining, ski area development, utility corridor construction, and other land uses on all ownerships has decreased lynx habitat to varying extents. Although there are no known current proposals for these types of developments on non-NFS lands, it is possible that there could be proposals in the future. Those developments could result in a loss of lynx habitat or reduced connectivity. Cleanup of the heavy metals contamination from mining in the Coeur d'Alene basin is ongoing and likely to continue into the future. This cleanup work would improve wildlife habitat over time, although the complete extent of improvement and how those effects overlap with effects from the revised Forest Plan is uncertain.

Grazing has occurred and would continue to take place on lands belonging to various entities, potentially impacting deciduous or riparian habitat for lynx prey species.

Fuels reduction efforts are possible on all land ownerships, in particular where they are near residences. If these are done in such a way that they restore habitat that has been degraded by fire suppression, then habitat for wildlife can be improved. If not, then habitat can be lost for some species and connectivity impacted.

Recreation is likely to increase on all land ownership types, if for no other reason than human population growth. This would increase human disturbance and cause the portions of NFS lands that have lower human disturbance to become more important.

Legal trapping occurs north of the Forest in Canada and could impact the number of lynx near the border. It is not legal to trap lynx in Idaho/Montana/Washington, but trapping for other species is permitted, potentially leading to non-target species like lynx being impacted.

In Canada, the main human activities that have and will continue to impact lynx range are timber harvesting, oil and gas exploration and development, coal mining and the proliferation of access that comes from all these industries. Loss of habitat in Canada, and a decline in lynx populations, could impact populations on the Forest due to the Forest being at the southern extent of the range for lynx (Schwartz et al. 2002). Populations in Canada provide gene flow into lynx populations south of the border. This emphasizes the desire to provide connectivity on the Forest as discussed under the Effects sections so that lynx populations on the Forest are connected to populations elsewhere in Idaho/Montana/Washington.

Effects Determination

Each action alternative may affect, and is likely to adversely affect Canada lynx and Canada lynx critical habitat.

Rationale for Determination: In spite of a general reduction in most allowable activities from current management direction, timber harvest (including thinning) and fire management activities, motorized access, road construction and reconstruction, and the low potential for mining, activities under the action alternatives—particularly in the General Forest MA—have the potential to adversely affect individual Canada lynx and their habitat via increased human disturbance, displacement and habitat alternation. At the project level, all activities would be subject to existing plan components such as standards and guidelines designed to avoid or minimize adverse effects to individual lynx and the habitats they occupy on Federal lands as well as the NRLMD standards and guidelines. Given that we cannot predict exact locations of future projects nor are there restrictions on the distribution of effects spatially or temporally, we cannot discount the potential for adverse effects to the Canada lynx and lynx critical habitat.

Grizzly Bear -- Ursus arctos horribilis

Affected Environment

Grizzly bears are identified as threatened in the two populations that reside (in part) on the IPNF. Two recovery zones overlap the IPNF: the Selkirk Recovery Zone (SRZ) and the Cabinet-Yaak Recovery Zone (CYRZ).The CYRZ is situated in the IPNF, KNF, and a small portion of the Lolo National Forest. The SRZ is situated in the IPNF, Colville National Forests, and British Columbia. The Ecosystems/Recovery Zones are also tied to areas in Canada, with the back and forth movement of bears between the two countries.

Habitat and Life History Needs

Grizzly bears (*Ursus arctos horribilis*) are habitat generalists, using a variety of habitats including the coniferous forests of northwest Montana and north Idaho. Habitat is generally dictated by food availability and distribution, as well as security from human disturbance and mortality. In Montana, grizzlies primarily use meadows, seeps, riparian zones, mixed shrub fields, closed timber, open timber, side hill parks, snow chutes, and alpine slabrock habitats. Habitat use is highly variable between areas, seasons, local populations and individuals (Servheen 1983, Almack 1985, Volsen 1994, Slone 2007, Weilgas 1994, Kasworm et al. 2010). Because grizzly bears have large home ranges, large areas of habitat are required. Grizzlies occupy low-elevation riparian areas, snow chutes and meadows in the spring and late fall, and move up to higher subalpine forests in the summer, early fall and winter.

Grizzlies are opportunistic and adaptable omnivores. Grizzly bears have a large vegetation component (more than half) to their diet and have evolved longer claws for digging and larger molar surface area to better exploit vegetation food sources. Grizzlies feed on carrion, fish, large and small mammals, insects, fruit, grasses, bark, roots, and mushrooms. They often cache food and guard it. Grizzlies are known to feed on a wide variety of plants (36 to 74 species). Food habits vary locally, seasonally and individually.

Grizzly bears occupy higher elevation subalpine forests and shrub fields in the summer, early fall and winter. Natural caves or excavated dens (typically above 5,000 feet in the SRZ and above 4,400 feet in the CYRZ) are entered after the first snowfall and occupied for four to five months (USDA Forest Service 2011b)[1]. After emerging from the den, grizzly bears typically move to the areas where they can take advantage of food sources such as early greening herbaceous vegetation at low elevations, riparian areas and in melted-out avalanche chutes (USDI Fish and Wildlife Service 1993a). These habitats consist of warmer sites or areas that are most likely to lose snow early and have an earlier green-up. Research has shown that grizzly bears, particularly sows with cubs-of-the-year, remain close to their den sites for a few weeks or more post-emergence (Craighead and Craighead 1972, Vroom et al. 1977, Schoen 1986, Mace and Waller 1997) and continue to rely on fat reserves during this time (Craighead and Sumner 1980 in Volsen 1994).

Additional information on population ecology, biology, habitat description and relationships are described in the Grizzly Bear Recovery Plan (USDI Fish and Wildlife Service 1993a) and the USDI Fish and Wildlife Service (2011a) 5-Year Review. Local research efforts for the SRZ include research by Almack (1985), Slone (2007), Volsen (1994), and Wakkinen and Johnson (2000), while Kasworm et al. (2011) provides specific research findings for the CYRZ grizzly bears.

Risk Factors Affecting Grizzly Bears

When grizzly bears in the lower 48 States were listed in 1975, the vast reduction in their historic range, increases in motorized and non-motorized routes and associated recreational use, high levels of human-caused mortality, livestock use, lack of population data, and genetic isolation were identified as factors affecting their conservation status (USDI Fish and Wildlife Service 1975). All of these threats have been addressed to varying degrees over time in the occupied grizzly bear ecosystems (USDI Fish and Wildlife Service 2011a). Recently, the FWS synthesized these threats into five grizzly bear risk factors and evaluated the situation in each of the six ecosystems (table 47) (Ibid).

Table 47. Five Risk Factors Potentially Affecting Grizzly Bear Conservation

GRIZZLY BEAR RISK FACTORS
Lack of effective Security Habitat
Mortality due to scientific or recreational purposes
Mortality from humans
Lack of regulatory mechanisms (e.g. motorized access management, oil & gas development, food storage orders/sanitation)

[1] The “active bear year” (time when a grizzly bear is active (i.e., not in the den) differs between the Selkirk and Cabinet-Yaak populations. Research on radio-collared bears demonstrated that most bears in the Selkirk ecosystem are active between April 1 and November 15th. Conversely, Cabinet-Yaak grizzly bears are active between April 1 and November 30th (Johnson 2008).

GRIZZLY BEAR RISK FACTORS
Genetic isolation; climate change; willingness of public to accept recovery efforts

Source: USDI Fish and Wildlife Service 2011a

The FWS concluded that the major threats to grizzly bears in the Selkirk population at this time were incomplete habitat protection measures (motorized access management), inadequate regulatory mechanisms including a lack of food storage orders and institutionalized access management, high levels of human-caused mortality, small population size, and population fragmentation that produces genetic isolation (USDI Fish and Wildlife Service 2011a). Similarly, the FWS noted that the major threats to the Cabinet-Yaak population were incomplete habitat protection measures, unsustainable human-cause mortality, small population size, and population fragmentation that resulted in genetic isolation (Ibid).

Habitat Effectiveness: The Grizzly Bear Recovery Plan (USDI Fish and Wildlife Service 1993a) identified adequate effective habitat as the most important element in grizzly bear recovery. Effective habitat is a reflection of an area’s ability to support grizzly bears based on the quality of the habitat and they type/amount of human disturbance imposed on it. Effective habitat allows for sufficient space for grizzly bears to roam and effectively use available habitats. By definition, effective habitat is an area or space outside or beyond the influence of high levels of human activity. Open roads, vegetation and fuels projects, and high-use recreational areas such as trails or campground are examples of activities that reduce the amount of secure habitat that is available and may result in displacement, habituation, or mortality of bears.

Secure habitat[1] is defined as areas greater than 500 meters (0.31 miles) from a motorized route[2] (USDI Fish and Wildlife Service 2011a). Unmanaged human use of motorized routes within grizzly bear habitat may produce or facilitate several kinds of effects to grizzly bears, including the following:

- Displacement from preferred habitat by human activities associated with road use with a resultant reduction in habitat availability and potential negative effects on nutrition and reproduction;
- Direct shooting mortality via mistaken identity while hunting for black bears or other game animals, defense of life actions, poaching for trophy animals, or through malicious killing; and
- Lethal attractants (human and animal foods/garbage) that arrive in grizzly bear habitat in motorized vehicles (excluding over-snow vehciles) may result in habituated bears that may ultimately be removed or euthanized.

Another potential source of motorized access disturbance and displacement to grizzly bears is over-snow motorized activity. The FWS noted that “snowmobiling has the potential to disturb bears while in their dens and after emergence from their dens in the spring” in their recent 5-year review (USDI Fish and Wildlife Service 2011a). After reviewing the available research and data, they concluded that the available data was anecdotal in nature but suggested the primary concern is the potential displacement of females with cubs from the immediate vicinity of the den site after they emerge in the spring (i.e., Haroldson et al. 2002). However, litter abandonment by

[1] Also referred to as “core area”

[2] Based on research examining the effect of roads and trails used by wheeled motorized vehicles during the non-winter months (i.e., passenger vehicles and all-terrain vehicles (ATVs)).

grizzlies due to snowmobiling activity has not been documented to date in the lower 48 States (Hegg et al. 2010 and Servheen 2010 (as cited in USDI Fish and Wildlife Service 2011a)). The FWS concluded that “while the potential for disturbance exists, the best available information suggests that current levels of snowmobile use are not appreciably reducing the survival or recovery of grizzly bears” (USDI Fish and Wildlife Service 2011a). However, they supported monitoring efforts focused at adaptive management decisions to “limit snowmobile use in areas where disturbance is documented or likely to occur” (Ibid).

Mortality: Human-caused mortality is considered to be one of the leading factors limiting grizzly bear recovery in the SCYEs. Human-caused mortality may result from any of the following:

- Hunting (legal and mistaken identity) and poaching;
- Attraction of grizzly bears to agricultural operations, improperly stored food, garbage, or improperly disposed dead livestock carcasses;
- Increased human occupancy of grizzly bear habitat, causing increased interactions, stress and/or self-defense killings;
- Interactions between livestock and grizzly bears leading to depredation on livestock; and
- Direct vehicle collision mortality may occur along major highways and railways within and between the recovery zones, both on NFS and private lands.

Human caused mortalities on NFS lands tend to be associated with poaching, mistaken bear identification and self-defense often associated with big game hunting activities (USDI Fish and Wildlife Service 2011b). Other key sources of mortality outside the action area and off NFS lands include sanitation/habituation removals in B.C. and deaths dues to highways and railway collisions. Grizzly mortalities associated with grazing operations on the IPNF are not an issue.

Hunting on both sides of the international boundary within the recovery zones has the potential to add cumulatively to legal, illegal, or mistaken identity mortality of grizzly bears within the cumulative effects area. The province of British Columbia and the states of Montana, Idaho, and Washington continue to allow hunting for black bears, as well as other wildlife species, on both sides of the border within and around the recovery zones. Legal hunting[1] of grizzly bears no longer occurs but grizzly bears are taken by poachers and occasionally are mistakenly killed during the black bear hunting season. As a result, Idaho began a voluntary black bear hunter testing and certification program in 2011 to help educate hunters in distinguishing species and reducing mistaken identity and reducing grizzly bear mortalities. This effort emulates an effort begun by the state of Montana who instituted a mandatory identification test in 2002.

A lack of sanitation measures or the preponderance of unsecured foodstuffs at developed and dispersed recreational sites, agricultural operations (i.e., orchards or grain crops), or hunting camps within grizzly bear habitat has the potential to habituate grizzly bears to humans. This may result in human/grizzly bear encounters and potential death/injury to humans as well as the removal or death of the bear.

Regulatory Mechanisms: A lack of regulatory mechanisms, especially in regards to motorized access and sanitation, mining development, and livestock grazing, may have significant negative effects on the ultimate recovery of grizzly bears (USDI Fish and Wildlife Service 2011a).

[1] Hunting of grizzly bears was legal in British Columbia until 2008 (British Colombia Ministry of Environment 2008, Mowat 2007, Mowat pers. comm. 2008).

Motorized access management and its effect on secure habitat (see section above) is one of most important regulatory mechanisms available to maintain and/or enhance grizzly bear habitat and reduce the risk of mortality. Likewise, sanitation storage and removal methods at developed and dispersed recreation sites, outfitter or individual hunting camps, and within livestock allotments, and/or universal forest-wide food storage orders all reduce the likelihood of habituation and subsequent grizzly bear removal or euthanasia. Oil and gas development and the potential for an increase in livestock developments within recovery zones also have the potential to negatively impact grizzly bear recovery (Ibid).

Genetics, Climate Change, Public Attitudes: Genetic isolation and an associated decrease in genetic diversity may reduce a species ability to adapt to selective pressures over time. Small populations of grizzly bears, such is the case with the SCYEs, are more likely to be at risk to reduced genetic diversity.

Additionally, climate change can potentially alter the distribution and amounts of bear forage by altering temperatures and disturbance processes (i.e., fire regimes and insect and disease outbreaks) (Ibid). However, he FWS does not anticipate that habitat changes predicted under climate change scenarios will directly threaten grizzly bears (Servheen and Cross 2010).

Some people's attitudes toward grizzly bears are associated with how they view management actions (e.g., changes in motorized vehicle access and associated reductions in timber harvest, or livestock grazing, or hunting access or food storage orders) done to benefit grizzly bears (Canepa et al. 2008). If viewed as a loss of "freedom" to use their national forest, it may result in higher mortality risk for grizzly bears. However, in general, there has been an improvement in public attitudes toward grizzly bears over the last several decades (USDI Fish and Wildlife Service 2011a). Effective 'Information and Education' programs increase public understanding of grizzly bears and reduce the likelihood of bear/human conflicts and bear mortalities while increasing human safety (Ibid).

Please see USDI Fish and Wildlife Service (2011a) for additional details regarding these five threats.

Bear Management Units, Critical Habitat, Bears Outside Recovery Zones, and Available Habitat

BMUs: Recovery zones are divided into areas known as Bear Management Units or BMUs, to facilitate population monitoring and habitat evaluation with each ecosystem. Each BMU is approximately the home range size of an adult female grizzly bear (average size about 100 square miles) (Christensen and Madel 1982). These BMUs assist in characterizing grizzly bear numbers and distribution within each ecosystem as well as analyzing and tracking cumulative effects (Ibid, USDI Fish and Wildlife Service 1993a).

The U.S. portion of the SRZ is comprised of ten BMUs, including five on the IPNF, four shared between the IPNF and CNF, and one BMU located exclusively on the Idaho Department of Lands. One of these BMUs, LeClerc, (which is primarily on the CNF with a minor portion on the IPNF) is less than 75 percent Federal ownership. Two of these BMUs, Kalispell-Granite and Lakeshore, were added to the recovery zone when the Recovery Plan was revised in 1993 due to seasonal use by grizzly bears in the mid-to-late 1980s (Servheen et al. 1991, USDI Fish and Wildlife Service 1993a). Although portions of the SRZ are within British Columbia, Canada, BMUs have not been formally designated in British Columbia.

There are twenty-two BMUs contained within the CYRZ, but only four BMUs are located on the IPNF and another two are shared between the KNF and IPNF. The Grouse BMU on the IPNF is less than 75 percent Federal ownership.

Critical Habitat: There is no critical habitat designated for grizzly bears.

BORZ: The 1993 Recovery Plan recognized that grizzly bears would occur outside the recovery zone lines and that the mere presence of bears outside of the recovery zone line is not sufficient reason to change the recovery zone lines (U.S. Fish and Wildlife Service 1993a). In recent years, credible observations of grizzly bears and radio-telemetry research data on collared grizzly bears have documented use in areas outside of existing recovery zone boundaries. These areas are called ‘Bears Outside Recovery Zones’ (BORZ) for the Selkirk and Cabinet-Yaak grizzly bear ecosystems, and they were subsequently incorporated into the amendments to the Kootenai (KNF), Idaho Panhandle (IPNF), and Lolo (LNF) National Forest Plans in 2011 (USDA Forest Service 2011b and 2011c). While observation data is limited and these habitats have not been evaluated to determine if they are of significant biological value it is recognized that on-going and future land management activities in these areas could result in adverse effects (e.g., incidental take) to grizzly bears (Allen 2011, USDI Fish and Wildlife Service 2011b).

A total of seven BORZ areas were identified as part of this process but only three of these are located within the action area: two BORZ associated with the SE (Priest Lake and Pack River) and one BORZ associated with the CYE (Mission-Moyie). The IPNF administers the majority of land included in these BORZ (Allen 2011). The BORZ areas are highly variable in size, ranging from less than 53 square miles (Pack River) to nearly 126 square miles (Mission-Moyie). Additionally, the boundaries of these areas are not static, but may be adjusted as grizzly bear use patterns are reevaluated [1] in future years (Ibid). Potential impacts from the Proposed Action will only address the three BORZ located within the action area.

BORZ areas have not been identified by the FWS as areas that are essential to the recovery of grizzly bears in the SCYEs and therefore the same set of management standards and conditions applicable to BMUs would not be appropriate to apply to these areas. If and when these areas are deemed essential they would be formally appended to the Recovery Zones through FWS action.

Available Habitat: Establishing a habitat model for grizzly bears in the Selkirk and Cabinet-Yaak recovery zones has been a high priority of the SCYE Interagency Grizzly Bear Committee (IGBC 2011). Three seasonal time periods are recognized as being important to grizzly bears in the SCYE: spring (April 1st – June 15th); summer (June 16th – September 15th); and fall (September 16th – November 15th (SE) or November 30th (CYE) (USDA Forest Service 2011b). Local research efforts documented habitat preferences of the SCYE grizzly bears, but did not result in comprehensive seasonal habitat maps (e.g., Kasworm et al. 2011, Volsen 1994). Most recently, Slone (2007) completed an assessment of seasonal habitat use of grizzly bears in the SCYEs. However, the two researchers that provided their data to Slone for his assessment felt that the Resource Selection Function (RSF) Slone developed did not accurately characterize the seasonal habitats in the recovery zones (Wakkinen pers. comm. 2008). Consequently, the Forest Service has no detailed seasonal habitat map to rely on for inclusion into the project analysis at this time.

[1] The forests coordinate with State and federal agency biologists to collect credible grizzly bear observations that occur outside of the recovery zone boundaries and add this information to a 6th order HUC data based for inclusion into an annual report to the FWS (USDI Fish and Wildlife Service 2011b).

Connectivity

Habitat connectivity within and between the SRZ and CYRZ has been identified as a possible factor that influences habitat (Servheen et al. 2003, Proctor et al. 2002 and 2005). Lack of habitat connectivity or "linkage" is associated with major highways and railways and the habitat within the approach zones near these features. The main "fracture zones" identified in Servheen et al. (2003) of concern area as follows: 1) CYRZ – SR-2 and SR-56 and the railway lines that parallel SR-2; 2) SRZ – B.C. Highway 3 (in Canada); 3) Between the SRZ and CYRZ – SR-95 and the parallel railway; 4) Between the CYRZ and the Bitterroot Mountains – SR-200 and the parallel railway; and 5) Between the CYRZ and the NCDRZ – SR-2 and SR-93. SR-95 and portions of SR-2 are located within the action area of the Proposed Action.

Additional work is ongoing throughout the Cabinet-Yaak, Selkirk, and Bitterroot Recovery Zones to further our understanding of linkage and movement (Kasworm et al. 2009). Servheen et al. (2001 and 2003) concluded that connectivity between recovery zones will rely on actions outside the jurisdiction of the Forests.

Within the IPNF, the "fracture zones" and "linkages" that overlap the Forest are within the SRZ (Priest Lake area) and between the SRZ and CYRZ (Highway 95). Although the other "fracture zones" listed above may concern the recovery zones that overlap the IPNF, those "fracture zones" and "linkages" do not overlap the IPNF. One occurrence of grizzly bear movement between the SRZ and CYRZ has been documented and another SRZ bear is suspected of moving to the Bitterroot ecosystem (Kasworm and Johnson 2008). In addition, occurrences of bear movement between the CYRZ and NCDE have been confirmed (Ibid). Genetic studies are on-going and at this time incomplete. These studies have not yet determined the relationship between these three populations.

Proctor et al. (2012) looked at population fragmentation and inter-ecosystem movements of grizzly bears in the northern US and western Canada. It is important that a small population like the Cabinet-Yaak is connected to larger populations in the NCDE and north in Canada to allow movement of bears, particularly females, into the CYE.

Current Management for Grizzly Bears

Current grizzly bear management in these ecosystems is governed in part by their threatened classification under the Endangered Species Act. Under the ESA no federal actions can cause jeopardy of grizzly bears. Interagency grizzly bear management guidelines have been developed for these managed lands and are part of the current Forest Plan on the IPNF. In addition the State of Montana has a grizzly bear policy (MCA 12.9.103) that outlines policy guidelines for Montana Fish Wildlife and Parks (MFWP) to promote the conservation of grizzly bears in Montana.

Tables 48 and 49 disclose the existing distribution of habitat under the 1987 Plan MA direction and the allowable activities and uses within identified grizzly bear habitat per the 1987 Plan MA direction and the 2008 IRR. Additionally, 51 and 10 percent of the SRZ and CYRZ (on the IPNF) overlaps, respectively, with LAUs. The standards and guidelines in the NRLMD (USDA Forest Service 2007) provide additional direction and limits in regards to vegetation treatments for lynx that may affect grizzly bear habitat.

Table 48. Grizzly Bear Habitat on NFS Lands by Existing (i.e., 1987 Forest Plan) Management Area Direction

Existing Condition (1987 Forest Plan) Management Areas (MAs)	Grizzly Bear Recovery Zone	
	Selkirk	Cabinet-Yaak
1 - Timber Production	40,206	2,395
2 - Timber Production within Grizzly Bear habitat	38,066	126,170
3 - Timber Production in Grizzly Bear & Big Game Habitat	4,399	12,324
4 - Timber Production within Big Game Winter Range	33,536	692
5 - Big Game Winter Range	0	0
6 - Timber Production within Elk Summer Range	0	0
7 - Caribou Management	116,792	0
9 - Non-Forest lands, lands non-suited	50,030	28,289
10 - Semi-primitive Recreation	33,500	32,801
11 - Existing and Proposed Wilderness	54,726	23,352
12 - Wild and Scenic River Systems	6,005	0
13 - Special Interest Areas	4,420	1,764
14 - RNA	2,876	1,503
15 - Primary Range[1]	NA	0
16 – Riparian[1]	NA	0
17 - Developed Recreation Sites	0	0
18 - Administrative Sites[1]	0	0
19 - Semi-primitive/Timber Production	0	19,295
20 - Semi-primitive unroaded with limited timber harvest	0	0
Total	**384,556**	**248,582**

[1]Not mapped as an MA

Table 49. Grizzly Bear Habitat by Allowable Uses and Activities under Existing (1987 Forest Plan) Management Area Direction and the Idaho Roadless Rule (2008)

Allowable Uses Under the Current Forest Plan Management Area Direction	Selkirk RZ Acres (%)	Cabinet-Yaak RZ Acres (%)
Timber Harvest	296,966 (77)	219,540 (88)
Timber Production	232,261 (60)	142,349 (57)
Commercial Use – Special Forest Products & Firewood	384,556 (100)	248,582 (100)
Personal Use – Special Forest Products & Firewood	384,556 (100)	248,582 (100)
Planned Fire Ignition	377,260 (98)	245,315 (99)
Natural, Unplanned Fire Ignitions to meet Resource Objectives	54,726 (14)	23,352 (9)
Grazing	323,825[1] (84)	225,230[1] (91)

Allowable Uses Under the Current Forest Plan Management Area Direction	Selkirk RZ Acres (%)	Cabinet-Yaak RZ Acres (%)
Motor Vehicle	320,706 (83)	246,387 (99)
Over-snow Motor Vehicle [2]	320,706 (83)	246,387 (99)
Road Construction (permanent or temporary)	284,143 (74)	188,930 (76)
Minerals – Leasable	158,587 (41)	94,194 (38)
Minerals - Materials	348,180 (91)	214,278 (97)

The magnitude of actual use and activity is regulated by the 2007 NRLMD and the 2011 Access Amendment standards (USDA Forest Service 2011) as well as other management direction and available budgets

[1] With no increase in existing allotments and no sheep on 37,935 of the Selkirk RZ and 138,494 acres of the Cabinet-Yaak RZ

[2] Does not include the current court-ordered snowmobile closure in the calculations

The Grizzly Bear Recovery Plan identifies recovery goals, objectives, and tasks necessary for recovery of the species. Many of these items relate to reducing human-caused mortality. Human access by motorized roads and trails can be a contributing factor to human-caused mortality of bears. The IGBC provided guidance for developing consistent management standards related to management of motorized vehicle access within the SRZ and CYRZ.

Most of the management strategies for grizzly bears are focused on three major themes:

- Management of habitat to ensure grizzly bears have large expanses of suitable interconnected lands in which to exist;
- Management related to grizzly/human interactions that most often result in the death of bears (and sometimes humans). This is a particularly important concern for female bears because their removal may have significant impacts on the demography of isolated populations; and
- Research to determine the population size and trends to ensure that grizzly bear populations are not being jeopardized.

The goal for grizzly bear management is to provide sufficient quantity and quality of habitat to facilitate grizzly bear recovery. An integral part of the goal is to implement measures within the authority of the Forest Service to minimize human-caused grizzly bear mortalities. This goal is accomplished by achieving a number of measures.

All of the lands within each recovery zone have been delineated into one of three management situations; MS1, MS2, and MS3. MS 1 lands are those areas managed for grizzly bear habitat maintenance, improvement and minimization of grizzly-human conflict. Management decisions will favor the needs of the grizzly bear when grizzly habitat and other land use values compete. MS3 lands include private lands, campgrounds or other lands where grizzly bear presence and factors contributing to their presence will be actively discouraged.

Key components of grizzly bear management on the IPNF include motorized access (excluding over-snow vehicles) management, sanitation, and information and education of forest visitors.

Access Management (except for over-snow vehicles): Past management actions on NFS lands related to motorized access (e.g., timber sales and associated road construction, road maintenance, and watershed improvements through sediment reduction from roads – including road decommissioning) have led to the existing motorized vehicle route system on the landscape. The Forest Plan Amendment for Motorized Access Management within the Selkirk and Cabinet

Yaak Grizzly Bear Recovery Zones (USDA 2011) established standards for core, Open Motorized Route Density (OMRD) and Total Motorized Route Density (TMRD) for each BMU in the Selkirk and Cabinet-Yaak Recovery Zones. Route densities include both roads and motorized trails. The standards that were established and their current status are displayed in table 50.

The Access Amendment used the best available science for these grizzly bear ecosystems to examine core areas, open motorized route density, and total motorized route density (Wakkinen and Kasworm 1997, Allen et al. 2011).

Core areas: The requirements of a core area include no motorized access (roads or motorized trails) during the active bear season, and a buffer of at least 0.31 miles (or 500 meters) from motorized routes (including open or gated roads). The goals are to incur no net loss of core area on NFS lands within all BMUs until all BMUs within the ecosystem meet all access standards. There is no minimum size for core area blocks in the Selkirk/Cabinet-Yaak recovery zones (USDI 2011 page 13, USDA 2011 Access Amendment FEIS page 78 and 335-340, USDA 2011 Access Amendment ROD page 60).

Open Motorized Route Density (OMRD) is calculated on a BMU basis using moving-windows analysis.

Total Motorized Route Density (TMRD) is calculated on a BMU basis using moving-windows analysis.

The Access Amendment also established timeframes in which all standards in individual BMUs in the SRZ and CYRZ would be met. Actual accomplishment dates will depend on management priorities, funding, and the completion of required environmental analyses (National Environmental Policy Act [NEPA]).

Table 50. Selkirk and Cabinet-Yaak Bear Management Unit Summary for the 2011 Bear

Bear Management Unit	Open Roads >1 mi/mi^2 (%)	Total Roads >2 mi/mi^2 (%)	% Federal Land	% Core	Priority
Cabinet-Yaak Recovery Zone					
1 (Cedar)	15 (15)	8 (15)	99	83 (80)	2
2 (Snowshoe)	18 (20)	16 (18)	94	77 (75)	2
3 (Spar)	30 (33)	26 (26)	95	62 (59)	3
4 (Bull)	38 (36)	29 (26)	84	62(63)	2
5 (St. Paul)	29 (30)	23 (23)	97	58 (60)	1
6 (Wanless)	32 (34)	34 (32)	85	53 (55)	1
7 (Silver Butte)	24 (26)	23 (23)	92	63 (63)	2
8 (Vermilion)	32 (32)	24 (20)	93	55 (55)	3
9 (Calahan)	28 (33)	27 (26)	90	58 (55)	2
10 (Pulpit)	45 (44)	27 (34)	95	54 (52)	2
11 (Roderick)	28 (28)	27 (26)	96	54 (55)	1
12 (Newton)	43 (45)	32 (31)	92	56 (55)	1
13 (Keno)	33 (33)	25 (26)	99+	59 (59)	1

Bear Management Unit	Open Roads >1 mi/mi^2 (%)	Total Roads >2 mi/mi^2 (%)	% Federal Land	% Core	Priority
14 (NW Peak)	28 (31)	26 (26)	99+	56 (55)	1
15 (Garver)	31 (33)	26 (26)	94	54 (55)	1
16 (EF Yaak)	29 (33)	27 (26)	96	54 (55)	1
17 (Big Creek)	31 (33)	16 (26)	99	56 (55)	2
18 (Boulder)	34 (33)	35 (29)	92	49 (55)	3
19 (Grouse)[3]	60 (59)	59 (55)	54	32 (37)	3
20 (North Lightning)	35 (35)	19 (20)	94	64 (61)	1
21 (Scotchman)	37 (34)	27 (26)	81	63 (62)	2
22 (Mt. Headley)	38 (33)	37 (35)	89	51 (55)	3
Selkirk Recovery Zone					
Blue Grass	35 (33)	28 (26)	96	50 (55)	1
Long-Smith	21 (25)	14 (15)	92	73 (67)	1
Kalispell-Granite	36 (33)	27 (26)	96	52 (55)	1
Salmo-Priest	30 (33)	24 (26)	99	67 (64)	2
Sullivan-Hughes	25 (24)	19 (19)	99	63 (61)	1
Myrtle	30 (33)	20 (22)	85	60 (56)	2
Ball-Trout	18 (20)	11 (13)	94	72 (69)	2
Lakeshore	81 (82)	50 (56)	86	21(20)	3
Le Clerc[4]	46	58	64	27	3

Administrative use limitations are applied on individual roads. The Access Amendment established the amount of administrative use that may occur on each individual gated road within the recovery zone, based on the bear year (spring, summer, and fall). Each district retains a count of use that occurs by road and reports that information to the USFWS.

Motorized access is also a concern in the (afore mentioned) BORZ. There are three areas (BORZ polygons) on IPNFs near the CYRZ and SRZ. Within each polygon, baseline conditions have been established for linear miles of open roads and total roads. The Access Amendment established that there will be no net increase in either open or total road linear miles above these baseline conditions. Baseline conditions are displayed in table 51.

Table 51. Bear Year 2011 Motorized Access Conditions for Bears Outside of Recovery Zone (BORZ) Areas Situated on the Idaho Panhandle and Kootenai National Forests

BORZ Name	Grizzly Bear Ecosystem	National Forest	Total Size (Acres)	NFS[1] Lands (Acres)	Total Roads on NFS Lands (Linear Miles) 2011/2010[2]	Open Roads on NFS Lands (Linear Miles) 2011/2010[2]
Priest	Selkirk	IPNF	80,733	75,793	316.4 (316.4)	314.4 (314.4)
Pack River	Selkirk	IPNF	33,869	28,097	37.7 (41.9)	33.7 (37.9)
Mission-Moyie	Cabinet-Yaak	IPNF	71,545	58,472	200.3 (200.3)	167.3 (167.3)

[1] National Forest System Lands

[2] 2010 represents the environmental baseline identified in the amendments to the Forest Plan (USDA Forest Service 2011b and 2011c)

Tables 52 and 53 disclose the existing distribution of acreages within the three BORZ areas under the 1987 Plan MA direction and the associated allowable activities. Additionally, 27 and 62 percent of the Selkirk and Cabinet-Yaak ecosystem BORZ (on the IPNF) overlaps, respectively, with LAUs. The standards and guidelines in the NRLMD (USDA Forest Service 2007) provide additional direction and limits in regards to vegetation treatments for lynx that may affect vegetation within the BORZ.

Table 52. Bears Outside Recovery Zone (BORZ) Area on NFS Lands by Existing (i.e., 1987 Forest Plan) Management Area Direction

Existing Condition (1987 Forest Plan) Management Areas (MAs)	Grizzly Bear BORZ	
	Selkirk	Cabinet-Yaak
1 - Timber Production	79,192	35,182
2 - Timber Production within Grizzly Bear habitat	376	68
3 - Timber Production in Grizzly Bear & Big Game Habitat	0	0
4 - Timber Production within Big Game Winter Range	13,043	8,663
5 - Big Game Winter Range	0	0
6 - Timber Production within Elk Summer Range	0	0
7 - Caribou Management	3,631	0
9 - Non-Forest lands, lands non-suited	4,512	14,229
10 - Semi-primitive Recreation	2,900	0
11 - Existing and Proposed Wilderness	0	0
12 - Wild and Scenic River Systems	0	0
13 - Special Interest Areas	0	0
14 - RNA	1	2
15 - Primary Range[1]	0	0
16 – Riparian[1]	0	0
17 - Developed Recreation Sites	0	0
18 - Administrative Sites[1]	0	0
19 - Semi-primitive/Timber Production	0	0
20 - Semi-primitive unroaded with limited timber harvest	0	0
Total	**103,655**	**58,143**

The Selkirk ecosystem BORZ includes Priest and Pack River while the Cabinet-Yaak ecosystem includes the Mission-Moyie BORZ. The suitability of these acres for grizzly bears is unknown

Table 53. Bears Outside Recovery Zone (BORZ) Areas on NFS Lands by Allowable Uses and Activities under Existing (1987 Forest Plan) Management Area Direction and the Idaho Roadless Rule (2008)

Allowable Uses Under the Current Forest Plan Management Area Direction	Selkirk BORZ Acres (%)	Cabinet-Yaak BORZ Acres (%)
Timber Harvest	103,654	58,143
Timber Production	96,242	43,914
Commercial Use – Special Forest Products & Firewood	103,655	58,143
Personal Use – Special Forest Products & Firewood	103,655	58,143
Planned Fire Ignition	103,654	58,143
Natural, Unplanned Fire Ignitions to meet Resource Objectives	0	0
Grazing	103,655	58,143
Motor Vehicle	103,655	58,143
Over-snow Motor Vehicle	103,655	58,143
Road Construction (permanent or temporary)	103,654	58,143
Minerals – Leasable	103,279	58,075
Minerals - Materials	100,754	58,143

The magnitude of actual use and activity is regulated by the 2007 NRLMD and the 2011 Access Amendment standards (USDA Forest Service 2011b and 2011c) as well as other management direction and available budgets. The Selkirk ecosystem BORZ includes Priest and Pack River while the Cabinet-Yaak ecosystem includes the Mission-Moyie BORZ. The suitability of these acres for grizzly bears is unknown

Sanitation: The presence of food attractants may result in bear/human encounters that often lead to the relocation or the death of the bear. After the two BMUs were added to the SRZ in the Priest Lake area in 1994 (i.e., Kalispell-Granite and Lakeshore), it was recognized that the increasing negative incidents of black bear encounters with humans due to poor sanitation practices on NFS and private lands in the area may result in habituation and/or death of a grizzly bear. Since 1998, there has been a concerted effort to improve sanitation on NFS lands throughout the ecosystem, with many campgrounds retrofitted—or scheduled to be retrofitted—with bear resistant garbage and/or food storage containers to reduce encounters and the potential for habituation. To date, there have been no grizzly bear deaths associated with food attractants on IPNF lands in the Selkirk or Cabinet-Yaak Recovery Zone. Additionally, all resort and recreation residence special use permits renewals in-or-near the recovery zones boundaries incorporate sanitation guidelines as part of the special use permit[1]. Finally, all four Forests that encompass these two recovery zones have implemented mandatory food storage orders that assist in minimizing this impact (USDA Forest Service 1989a, 2011d, 2011e).

Public Education: Public education is an important element of any program designed to reduce grizzly bear mortalities. Through education, people can learn to live in a way that is more compatible with the needs and behaviors of bears. Education programs can reduce bear mortalities in instances of self-defense and habituation to unnatural foods. The IPNF and cooperating agencies (Idaho Department of Fish and Game, Idaho Department of Lands)

[1] According to Forest Service records, there has been one black bear/sanitation incidences associated with the Forest Service recreation residences. This involved a black bear breaking into an outhouse.

maintain and financially support a regular program of public information and education within the SRZ and CYRZ.

Key Stressors Affecting Grizzly Bears

Of the management activities allowed under the Proposed Action, motorized access and associated road construction, mineral extraction, livestock grazing and timber harvest are the key stressors to grizzly bears. Planned fire ignitions are typically associated with timber harvest; therefore it is considered interrelated and interconnected to timber harvest. Conversely, natural ignitions may have impacts on grizzly bear habitat but are not completely within the Forest's ability to stop or reduce all impacts. Both of these topics are considered under the heading of Fire. Improperly stored attractants associated with livestock grazing, special use permittees, recreation residences, outfitter and guide hunting activities, and livestock grazing activities is also considered a key stressor to grizzly bears. The latter is discussed where it may occur under the appropriate allowable management activity (i.e., grazing) that is part of the Proposed Action. Finally, collection of other forest products is allowed under the Proposed Action. This activity is typically interrelated and interconnected to motorized access.

Road Construction and Motorized Access: The relationship between grizzly bears and roads has been studied extensively (i.e., Aune and Kasworm 1989, Kasworm and Manley 1990, Mace and Manley 1993, Mace et al. 1996, Mace and Waller 1997, Mattson et al. 1987, McLellan and Shackleton 1988, Wakkinen and Kasworm 1997, Schwartz et al. 2010). Unmanaged human use of motorized roads and trails within occupied grizzly bear habitat may produce or facilitate several kinds of adverse effects to grizzly bears, including the following:

- Bears may be displaced from preferred habitat by the human disturbance associated with road use, with a resultant reduction in habitat availability and quality and potential effects on nutrition and reproduction;
- Direct shooting resulting in injury or mortality may occur through mistaken identity for black bears or other game animals, through defense of life actions, through poaching for trophy animals, and through malicious killings;
- Attractants (human and animal foods and garbage) brought into grizzly bear habitat in motorized vehicles may result in habituated bears that may eventually need to be destroyed, or may result in human/bear conflicts that result in a poor outcome for the bear;
- Some bears may become conditioned to the presence of vehicles and humans on roads and thus become more vulnerable to direct mortality through the means identified above; and
- Direct vehicle collision mortality may occur along major highways within and between the SRZ and CYRZ, both on NFS and private lands.

Habitat security is an important element of grizzly bear management, helping to minimize human-caused bear mortalities and displacement from preferred habitats. By definition, security habitat is an area or space outside or beyond the influence of high levels of human activity. Motorized access is an important component of providing sufficient secure and effective habitat for grizzly bears. Motor vehicle use on roads under the existing condition and the Proposed Action within grizzly bear habitat is guided by the Access Amendment. The Access Amendment set criteria for such things as administrative use on gated roads, OMRD, TMRD, and Core within the Selkirk and Cabinet-Yaak ecosystems (SCYE). It also sets caps on the linear miles of road within the BORZ areas.

Motorized Over-snow Access: Over-snow vehicles are considered to be motorized vehicles and presumably are somewhat similar in their disturbance effects to grizzly bears as other motorized vehicles. However, direct or indirect impacts from over snow vehicles to hibernating bears are not well documented. Additionally, because the potential response of individual bears to disturbance in winter varies greatly from no response to den abandonment, the possible impacts to individual bears is difficult to measure. Therefore, the disturbance intensity and the severity of over snow vehicle use on grizzly bears are difficult to quantify or describe directly.

In 2000, scientists, wildlife managers and academia participated in a workshop to assess the effects of over-snow vehicles on wildlife, including grizzly bears (Graves and Reams 2001). The participants discussed possible effects to bears and determine that impacts to grizzly bears from over snow vehicles during den emergent posed a greater threat than those to denning bears. As mentioned previously, this conclusion was supported by the FWS in their recent 5-year review (USDI Fish and Wildlife Service 2011a), specifically “Our best information suggests that current levels of snowmobile use are not appreciably reducing the survival or recovery of grizzly bears.” Also in the 5-year review, USFWS stated, “We found no studies in the literature specifically addressing the effects of snowmobile use on any denning bear species and the information that is available is anecdotal in nature.” Additionally, they supported monitoring efforts focused at adaptive management decisions to “limit snowmobile use in areas where disturbance is documented or likely to occur” (Ibid).

A key component of understanding the potential impact to grizzly bears from over snow vehicles is addressing the expected level of use and distribution of over snow vehicles across the landscape, particularly during den emergence. On the IPNF during the month of November, over-snow vehicle use is rare to non-existent due to the lack of snow or poor snow conditions. Over-snow vehicle use begins to increase starting in December and decreases in March, with the peak of use being January and February. During the month of April, over-snow vehicle use is minimal based on decreasing snowpacks and avalanche danger, with local, dedicated users attempting to access high elevation openings. Over-snow vehicle use continues to be rare to non-existent in May due to the lack of snow or the lack of drivable access to areas containing sufficient snow due to soft roadbed conditions. Even during the highest peaks of over-snow vehicle use, activity is far greater on weekends along established routes and use areas than at any other time or location. During the week or in off trail areas there is a precipitous drop in over-snow vehicle use[1].

Mineral Extraction Activities: Generally, the impacts of mining on terrestrial wildlife species, including grizzly bears, result from the habitat loss and degradation from the footprint of the mining operation, required infrastructure (i.e., road construction and development), and the human disturbance where individuals are displaced from key habitats. All of these activities result in a decrease in habitat security for grizzly bears.

There are no major mining operations on the IPNF at this time. Known oil and gas deposits on the IPNF, and geothermal energy potential is very low. As such, little commercial interest in leasing for such resources is anticipated. Future development of locatable minerals is expected to be very limited within the action area. However, there are active and planned major mining activities in the CRZ outside the action area on the KNF (i.e., Rock Creek, Montanore, and Troy Mines).

Livestock Grazing: The 1975 listing identified “…livestock use of surrounding national forests” as detrimental to grizzly bears “…unless management measures favoring the species are

[1] Data is based on on-the-ground monitoring by recreation and law enforcement staff as well as some aerial monitoring.

enacted" (*Federal Register 1975*). The FWS noted in their 5-year review that grizzly bears frequently coexist with cattle without depredating them but often depredate on sheep (USDI Fish and Wildlife Service 2011a). This may lead to relocation or removal of the bear. Additionally, cattle or sheep that die on the allotment from natural or other causes and are subsequently scavenged by a grizzly bear have the potential to habituate bears to livestock as a food source (Servheen 1981, Aune and Stivers 1983).

Cattle grazing are currently permitted in two allotments that overlap BMUs in the SRZ (14,328 acres) on the Forest. There is no opportunity to increase the number of allotments allowed within most of the grizzly bear habitat that would be suitable for grazing within the two recovery zones under the current Forest Plan. Furthermore, there are no known incidents of grizzly bears depredating on cows in these allotments. Grazing permits include sanitation measures to reduce the likelihood of bears becoming habituated to livestock carcasses.

Timber Harvest: In general, grizzly bears are considered habitat generalists, where the most important habitat characteristics revolve around the availability of sufficient food resources and areas free from human disturbance (i.e., secure habitat). In the absence of the large wildfires (which was common before fire exclusion practices) silviculture methods can provide similar early seral plant communities (Johnson and Gautreaux 2008). However, timber harvest has the potential to alter both habitat quality/quantity and the amount of human disturbances as follows (IGBC 1987):

- Vegetation management, including timber cutting, in grizzly bear habitat may alter forest conditions sufficiently to change the composition, distribution, and abundance of forage for grizzly bears;
- Existing water regimes may be indirectly impacted by timber harvest activities, where changes in surface and/or subsurface water movement and/or distribution contribute to changes in key grizzly bear foraging habitats, such as *carex spp*. Meadows;
- Timber cutting activities that require construction of new roads or reconstruction of currently un-drivable roads may increase human access to grizzly bear habitat previously remote from such activities, which as discussed above, has the potential to increase grizzly bear mortality where human/bear interactions result; and
- Timber cutting activities in and of themselves introduce human disturbance into the environment during implementation, which can displace bears from key habitats, at least temporarily.

However, timber harvest is usually associated with road construction and multiple years of harvest and post-harvest activities which create disturbance and cause grizzlies to avoid the area. Additionally, many timber harvest operations include helicopter logging. If the latter occurs in grizzly bear core habitat, it can affect grizzly bears resulting in their displacement (USDI Fish and Wildlife Service 2010).

The acres of grizzly bear habitat where timber harvest will be allowed are reduced under the Proposed Action in both recovery zones on the IPNF but remain unchanged in the BORZs. This will reduce the disturbance, displacement and potential mortality risk associated with motorized access, helicopter logging, and harvest/post-harvest activities.

Fire (natural ignitions, planned ignitions): Seral plant communities, which historically originated from wildfires and insect and disease outbreaks, provide many key grizzly bear foods. Fire in grizzly bear habitat can be beneficial or detrimental depending on when and where it occurs, and the scale at which it occurs. In general, fire is thought to have a positive effect on grizzly bear habitat and the decline of grizzly bear populations has been attributed to fire suppression (Contreras and Evans 1986 and Tirmenstein 1983). Grizzly bears are an opportunistic species with very large home ranges and their populations change little in response to fire (Smith 2000). Fires promote and maintain many important berry-producing shrubs and forbs and provide a medium for insects and sometimes carrion (associated primarily with very large fires). However, fire can also affect other food sources such as the availability of whitebark pine nuts. So, although grizzly bears may benefit from improved habitat quality due to periodic burns, a very large fire could destroy key habitats resulting in habitat fragmentation (USDI Fish and Wildlife Service 2011b).

Conversely, fire suppression throughout the western U.S. over the past 50 to 100 years has substantially altered the natural succession of many forested ecosystems, whereas early successional forest stages have been reduced or eliminated (Lee and Jonkel 1981, Zager 1980 (as cited in IGBC 1987)). Such changes have likely impacted the availability of many key forage species for bears. Use of prescribed fire has the potential to improve grizzly bear habitat, particularly where it creates openings which can support berries, bulbs and other important grizzly foods, reduces conifer encroachment into brushfields, meadow habitats and high-elevation whitebark pine[1] stands, and increases understory plant growth where nutrients are released from conifer litter.

Most prescribed burning in grizzly bear habitat on the IPNF has been associated with post-harvest treatments although there have been a few landscape prescribed burns in recent years to promote habitat improvement for big game winter range and whitebark pine restoration. Short-term adverse effects to grizzly bears from prescribed fire could occur where implementation overlaps grizzly bear activity in space and time. Limited operating periods applied at the project level may assist in minimizing negative effects during periods of high grizzly bear use.

Other Forest Products: Other Forest Products includes personal and commercial firewood collection, limited personal use permits for such items as rocks and trees, and all other unpermitted use of forest products such as huckleberry or mushroom collection. Generally, the collection of forest products occurs in close proximity to roads and the density of people engaged in this activity diminishes with increasing distance from a road or trail. Disturbance and displacement due to human activity and motorized use would be the main effect from the collection of forest products (see effects from motorized access above). There may be some loss of resources for bears due to the collection of forest products (mushrooms or berries), but again, the areas where collection would be likely to occur would be near roads. Bears would be less likely to use resources near roads due to this disturbance.

Past and Ongoing Impacts Associated with Key Stressors

Timber Harvest, Unplanned and Planned Fire Ignitions: Seral plant communities, which historically originated from wildfires and insect and disease outbreaks, provided many key grizzly bear foods. In the absence of the large wildfires (which was common before fire exclusion practices) silviculture methods can provide similar plant communities (Johnson and Gautreaux 2008).

The quantity and distribution of grizzly habitat has changed over time on the Forest due, in part, to fire suppression over the last several decades. Conversely, timber harvest over the last several

[1] Unlike the situation in the GYE and parts of the NCDE where whitebark pines can be an important part of the grizzly bear population diet, whitebark pine is not a key food source in the SCYEs (page A-35 in USDI Fish and Wildlife Service 2011b).

decades created seral conditions that may provide excellent grizzly forage, but was usually in close proximity to high road densities and likely avoided by bears. Approximately 14,100 acres of timber harvest has occurred within the two recovery zones since the 1987 Forest Plan was implemented. The lower elevation, drier forests have been the most impacted by fire suppression which likely contributes to lower forage availability on spring range. In addition, approximately 14,561 acres of timber harvest occurred within the BORZ since the Forest Plan was implemented. This includes 6,209 acres and 8,352 acres in the Selkirk and Cabinet-Yaak BORZ, respectively.

Since 1987, 3,695 wildfire events have burned approximately 24,000 acres across the Forest. Seven hundred and forty-three of these events occurred within BMUs and burned approximately 13,300 acres. This includes 473 (9,745 acres) and 263 (3,567 acres) fire events in the Selkirk and Cabinet-Yaak recovery zones, respectively. These fire events provide opportunities for creation of important early seral habitat for grizzly bears, where extensive huckleberry shrub fields (e.g., the SRZ 1967 Trapper Creek burn) can provide key seasonal habitat for local grizzly bear populations (Volsen 1994). In addition, there were 190 fire events that occurred within the BORZ and burned approximately 221 acres. This includes 106 (168 acres) and 84 (52 acres) fire events in the Selkirk and Cabinet-Yaak BORZs, respectively.

Most prescribed burning in grizzly bear habitat has been associated with post-harvest treatments although there have been a few landscape prescribed burns in recent years. Since 1987, the IPNF has completed 1,342 planned prescribed burns covering 47,000 acres, with approximately 600 acres of treatment occurring within three BMUs in the two recovery zones. Another 193 prescribed fires were ignited within the BORZ during this same time period that burned approximately 3,573 acres. This includes 166 (2,920 acres) and 27 (654 acres) fire events in the Selkirk and Cabinet-Yaak BORZs, respectively.

Motorized Over-snow Routes: There are 14 miles of groomed routes located in approximately 118,200 acres of available modeled grizzly bear denning[1] habitat within the SRZ portion of the action area. Additionally, there are 26 miles of groomed trails within 74,750 acres of modeled grizzly bear denning habitat within the CYRZ portion of the IPNF. Off-route use occurs on approximately 7,440 and 24,600 acres of the IPNF portion of the Selkirk and Cabinet-Yaak recovery zones, respectively. Both on and off-route snowmobile travel combined occurs on about six and 19[2] percent of modeled denning habitat on the IPNF portion of the SRZ and CYRZs, respectively. However, the actual magnitude and location of this use during the post-emergence period (i.e., after April 1) is greatly reduced due to a combination of limited public participation and snow conditions. Table 54 summarizes the existing over-snow motorized access within BMUs and denning habitat on the IPNF. Snowmobiling also occurs on approximately 95 miles of groomed trails in the Priest and Pack River BORZ. There are no groomed trails within the Mission-Moyie BORZ.

The IPNF is in the process of completing a Winter Travel Plan that addresses over-snow motorized use in the SRZ. It is anticipated that this will be completed in the next two-to-four years.

[1] Grizzly bear denning habitat was modeled separately for the two ecosystems using local research data.
[2] Over-snow motorized use occurs on approximately nine percent of the entire Cabinet-Yaak recovery zone.

Table 54. Current Motorized Over-snow Access within Grizzly Bear Recovery Zones on the IPNF

Type of Allowed Access	Selkirk Recovery Zone		Cabinet-Yaak Recovery Zone	
	BMU	Denning	BMU[1]	Denning
Total Area with the IPNF (acres)	384,560	118,200	247,460	74,760
Total Area where Over-snow Use is Allowed (acres)[2]	320,700	99,960	246,400	74,760
Groomed Over-snow Routes (miles)	130[3]	14[3]	86	9
Over-snow Motorized Use (acres)[2]	19,930[3 & 4]	7,440[3 & 4]	47,740	14,250

[1] Includes IPNF data from the Boulder, Grouse, North Lightning, Northwest Peaks, Keno, and Scotchman BMUs only. Total recovery zone=1,649,300 acres; total denning=489,720 acres

[2] Many of these areas have limited accessibility for snowmobiling off-route due to tree densities and topography (USDA Forest Service 2011b and 2011c)

[3] The Selkirk Recovery Zone includes the 2007 federal court order to protect woodland caribou, which will be lifted once winter travel planning is complete (likely 2014-15). The current use reflects this closure

[4] Motorized over-snow activities is precluded on 95 percent of these acres from March 15 – 30 or April 1 – June 30 under closure orders to protect grizzly bears

Livestock Grazing: In 1979, there were 73 allotments on the IPNF with the majority of forage produced on 7,500 acres of meadow and permanent grasslands. The 1987 Forest Plan permitted livestock use to be 6,700 AUMs. However, cattle grazing have been declining on the Forest, with an average of only 3,086 AUMs from 1996 through 2009. Today there are only 14 allotments on the Forest with a total of 2,375 AUMs. This decline can be attributed to the re-growth of trees on transitory range, changing patterns of private lands use, and rising industry costs that make small allotments uneconomical. The number of allotments and number of AUMs is expected to remain the same over the next 10-15 years (see the “Range” section).

There are two cattle grazing allotments covering 14,328 acres of grizzly bear habitat situated in two BMUs within the IPNF Proposed Action Area. No increase in livestock operations within grizzly bear habitat located in MA2 and MA3 (181,378) is allowed under the existing Forest Plan direction. The IGBC Guidelines concerning grazing are used in managing these allotments (IGBC 1986).

Portions of two additional cattle grazing allotments (approximately 3,930 acres) are situated in the Priest River BORZ within the IPNF Proposed Action Area.

Minerals (Locatable and Materials): There are no major mining operations on the IPNF at this time. There are currently 1,232 Plans of Operations for locatable minerals on the IPNF. Of these, 17 are located in grizzly bear recovery zones (SRZ=4; CYRZ=13) and 14 are located in BORZ (Selkirk[1]=3; Cabinet-Yaak[2]=11). The majority of on-going activities are related to maintenance of existing facilities. Most locatable mineral operations are less than five acres in size. Potential for future mineral discovery is considered “low.”

There are approximately 434 active mineral material pits and quarries within the IPNF and of these 62 sites are located in the recovery zones (SRZ=26; CYRZ=36) and 19 are located in the BORZ (Selkirk=8; Cabinet-Yaak=11). Sites are typically from less than one acre to five acres in size.

[1] Priest River and Pack River BORZs
[2] Mission-Moyie BORZ

There are no leasable minerals located on the IPNF at this time and potential is considered "low."

Other On-Going Activities within the Project Area

Recreational Activities: The IPNF is easily accessed and has a growing and changing visitor base. Most of the visitation is local with strong ties to the Forest. Traditional uses include hiking, hunting, fishing, gathering, biking, water-based camping, and boating. Winter activities are snow dependent and focus on snowmobiling.

Outdoor recreation is the fastest growing use within the national forest and it is a use that is expected to increase in the future. Since the 1980, both motorized and non-motorized recreation use of the roads, trails, and general forest areas have increased. Food, horse, and mountain bike travel have increased, and to a lesser degree, cross-country and backcountry skiing receive use as well.

Hunting in the United States and Canada: The province of British Columbia and the states[1] of Montana, Idaho, and Washington continue to allow hunting for black bears, as well as other wildlife species, on both sides of the border within-and-around the SRZ and CYRZ[2], although black bear hunting seasons have also been shortened in recent years. Idaho prohibits baiting and hunting bear with hounds in grizzly bear recovery zones[3], and has supported a grizzly bear law enforcement and education position in the SRZ to facilitate public education and hunter awareness since 1990 (Allen-Johnson 1991, Wakkinen et al. 2009). Hunting of grizzly bears in British Columbia is no longer permitted in the areas north of the SRZ and CYRZ (G. Mowat pers. comm. 2008, British Columbia Ministry of Environment 2008, Mowat 2007).

Montana Fish, Wildlife and Parks instituted a voluntary bear identification course for hunters in 2001 and made it mandatory in 2002 to assist with reducing grizzly bear mortality within the state. The states agencies for Idaho and Washington recently instituted a voluntary program in their respective states (IGBC SCYE 2011).

Special Use Permits (SUPs) and Agreements: Special use authorizations permit occupancy and use on NFS lands by federal, state and locate agencies, private industry, and individuals. Recreation special use permits are of particular interest in evaluating effects to grizzly bears due to their proximity to grizzly bear habitat and their potential to create sanitation issues or generate some level of disturbance or displacement. The IPNF currently has 190 recreation Special Use Permits and agreements (see the "Access and Recreation" section). One hundred and forty-five of these are recreation residences with 119 of these are located in the Priest Lake area in-or-near the SRZ boundary. In addition, three resorts operate in the Priest Lake area but these are not located within the recovery zone boundary. All of these SUPs include sanitation guidelines[4].

There are seven challenge-cost share agreements that permit winter grooming of snowmobile trails on the IPNF, and two of these are located in grizzly bear habitat. Outfitter and Guides (for hunting and fishing) also operate on NFS lands under special use permit. This includes two outfitter and guides which operate within the SRZ with one of these extending their operations

[1] State fish and game agencies include Montana Fish, Wildlife and Parks, Idaho Department of Fish and Game, and Washington Department of Fish and Wildlife.
[2] The states complete consultation with the FWS for these activities.
[3] IDF&G is allowing 15 permit holders to hunt with dogs in portions of Unit 1 that include Priest Lake and Mission-Moyie BORZ areas in 2012.
[4] All residential SUPs expired in 2008. Sanitation guidelines were subsequently included in all reissued SUPs.

into the Priest Lake BORZ. Three additional outfitter and guides operate in the CYRZ. Three of these Outfitter and Guides are allowed to use snowmobiles as part of their permit (i.e., two in the SRZ; one in the CYRZ).

The permitting of special uses will not be changed with implementation of the Proposed Action, including the requirement for a permit specific analysis for any renewals or modifications to existing permits or proposed new permits to insure compliance with the Forest Plan.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Attractants: A mandatory food storage order was implemented in 2011 for the Sandpoint, Bonners Ferry, and Priest Lake Ranger Districts. This applies to all alternatives, including Alternative A. Additionally, under the action alternatives, FW-STD-WL-03 states that permits and operating plans should have sanitation measures included to reduce wildlife/human conflicts by making attractants inaccessible through proper storage and disposal. This would include garbage, food, and livestock carcasses.

Motorized Routes: Current management of roads within grizzly bear habitat is guided by the Access Amendment. This would be also true under Alternatives B Modified, C, and D. Under the action alternatives, FW-DC-WL-02, FW-DC-WL-04 and 05, FW-DC-WL-07, FW-STD-WL-02, MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, MA5-DC-WL-01, GA-DC-WL-LK-03, and GA-DC-WL-PO-02, GA-DC-WL-PR-02,GA-DC-WL-SJ-01 reduce the possibility of road related impacts by creating security habitat with lower human presence due to lack of motorized access. This security habitat provides areas on the Forest where bears can escape the disturbance associated with roads. The chance of persecution and therefore poaching would be less in these areas compared to those with open roads.

FW-STD-WL-02 in particular would be useful for minimizing road impacts to grizzly bears because it states that the Access Amendment would be applied. Motorized routes facilitate human access, so limiting the availability of motorized routes provides more habitat for bears where the likelihood of human presence would be lower. Non-motorized access can still occur throughout the IPNF, and although there would be still a chance of human-bear interactions resulting in disturbance to the bears, there would be a lower probability due to lower human densities in those areas without motorized routes. There are also wilderness, roadless, and other areas with limited or unlikely motorized use and therefore places where disturbed bears can shift their habitat use. FW-DC-WL-18 and FW-GDL-WL-15 through 17 would reduce the impacts of roads on connectivity.

There would be no change in roads or trails open to motorized use in the alternatives. The acres available for cross-country motorized use would also not change. There would be a difference in the acreage where roads/trails may be designated for motorized use. Within the grizzly bear recovery zones (633,138 acres total), Alternative C (486,448 acres motorized; 77 percent) would have the least acreage allowing motorized use, followed by Alternatives B Modified (502,653 acres motorized; 79 percent), D (520,341 acres motorized; 82 percent) and A (567,093 acres motorized; 90 percent). The acreage where road construction (both temporary and permanent) could occur would be greatest under Alternatives D (516,863 acres), followed by B Modified (500,975 acres), Alternative C (486,449 acres) and A (473,073 acres).

Livestock Grazing: FW-GDL-WL-18 states that the elements in the IGBC Guidelines would be applied, which includes direction on grazing. The IGBC Guidelines also applies under current management. Grazing does not occur on a lot of the Forest, and all grazing permits would have sanitation measures to reduce attractants that would cause a human/livestock/bear conflict (FW-STD-WL-03). FW-DC-GRZ-01 states that grazing occurs at sustainable levels while protecting resources and FW-DC-WL-03 states that recovery of threatened and endangered species would be the long-term desired condition. If any livestock/grizzly problems occur in the future, this direction from the revised Plan would aid in resolving the conflict.

Motorized Over-snow: This would be primarily a concern during spring emergence (essentially the month of April). Alternative A would have acres open to over-snow motorized use. Under the action alternatives, FW-DC-WL-01 states that dens for threatened and endangered species are relatively free of human disturbance when they are in use. With FW-DC-WL-03 recovery of threatened and endangered species would be the long-term desired condition. FW-DC-WL-04 also states that low levels of disturbance exist in BMUs to facilitate bear use such as denning. FW-GDL-WL-01 restricts activities during spring emergence where predicted denning habitat occurs.

Alternative C (486,449 acres over-snow motorized) would have the least acreage of grizzly bear habitat located within the recovery zones allowing over-snow motorized use, followed by Alternatives B Modified (520,300 acres over-snow motorized), D (527,617 acres over-snow motorized) and A (567,093 acres over-snow motorized)[1].

Only 6-9 percent of modeled grizzly bear denning habitat current has snowmobile use during spring emergence in the CYRZ and 6 percent of the SRZ. Alternative B Modified would potentially reduce this figure even lower.

FW-STD-WL-04 states that no grooming of snowmobile routes in grizzly core habitat would occur in the spring after April 1 of each year. This would reduce the chance that disturbance could occur during spring emergence due to snowmobile use.

Mining FW-GDL-WL-18 states that the elements in the IGBC Guidelines would be applied; this includes direction on minerals activities. Major mining activities (i.e., Rock Creek, Montanore, and Troy Mines on the KNF) are active or are planned in the CYRZ. Each of these projects includes a substantial mitigation plan that addresses multiple risk factors including changes in motorized vehicle access, potential displacement, attractants, and law enforcement. These changes are not expected to provide security levels above those in the decision for the Access Amendment, but rather are expected to assure achievement of proposed standards, which result in an improvement over existing conditions.

FW-DC-WL-01, FW-DC-WL-03, and FW-DC-WL-04 would reduce impacts to grizzly bears. Additionally, the Access Amendment (applied through FW-STD-WL-02) set access standards that each BMU would trend towards, so mitigation would likely entail offsetting any increases in access and decreases in core habitat. FW-DC-WL-18 and FW-GDL-WL-15 through 17 would reduce the impacts of a high use haul/supply route on connectivity if that was considered an issue.

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[1] There is virtually no difference in the amount acres where over-snow activities is allowed within the BORZ among the alternatives. Alternative C has approximately 2,759 acres less than the others but virtually all of the BORZ are open to over-snow motorized activities.

Cumulative Effects

In general, cumulative effects are assessed for the Forest and adjacent lands. The period considered for this analysis is the anticipated life of the Plan, 10-15 years.

The primary reason for the low population of grizzly bears in these recovery zones is past persecution and killing of bears. Legal protections are now in place to protect grizzly bears. Information/education programs, sanitation programs, and access management have all been used, and are still being used, to help these populations recover.

Timber harvest, fuels reduction, and fire suppression on NFS lands have contributed to the amount and pattern of habitat present today. Openings created by management activities, depending on the location, can provide forage for grizzly bears. Fire suppression in some areas may have allowed conifers to encroach upon openings and limited the amount of new openings created that could provide forage. Access management to limit the amount of roads and thereby reduce the chance of a human-grizzly interaction has increased over the years and resulted in the recently adopted Access Amendment.

Timber harvest occurring on private, State, or Canadian lands may impact the distribution, amount, and quality of grizzly habitat and may impact connectivity between NFS lands. The SRZ and CYRZ include approximately 229,000 acres of private and State lands. Activities here may cause avoidance of these areas, or conversely, increase the potential for habituation and subsequent removal or death of these bears for public safety. To date, there have been two incidents of grizzly bears becoming habituated to homes and food attractants that have resulted in relocation or mortality of problem bears. The desired conditions for vegetation in the revised Forest Plan would maintain or improve connectivity for grizzlies within the IPNF, and contribute toward maintaining or improving grizzly habitat on NFS lands.

The desired condition for connectivity (FW-DC-WL-18 and FW-GDL-WL-15 through 17) in the revised Forest Plan would direct the IPNF to work with other agencies and landowners when highways are proposed to be constructed or reconstructed to incorporate crossing structures where needed. This would also aid in maintaining some connectivity between NFS lands as private lands are subdivided in the future. It would also help reduce road related grizzly bear mortalities. The most likely places for private lands to be subdivided would be in the valleys where communities already exist or nearby. These are the areas that already pose difficulties for connectivity.

The decision for the Access Amendment established management direction for NFS lands within grizzly bear habitat. However, the SRZ and CYRZ also include State, corporate and private lands. Decisions made by these landowners regarding management on their lands could potentially result in cumulative disturbance or displacement effects to grizzly bears. In many cases, the Forest Service would ultimately mitigate for these effects through additional motorized vehicle access management on NFS lands. The numbers used for road densities and Core Area in this analysis include consideration of roads on State and private lands within grizzly bear habitat, even though the standards apply only to NFS lands.

Past mining, ski area development, utility corridor construction, and other land uses on all ownerships have decreased grizzly habitat to varying extents. These types of activities may continue in the future and result in further loss of habitat or displacement of grizzlies. Grazing has occurred and would continue to take place on lands belonging to various entities, potentially creating an attractant such as carcasses, and leading to human-wildlife conflicts.

The Idaho State Wildlife Conservation Strategy would improve habitat for a variety of species, and when utilized on non-NFS ownerships should complement habitat improvement/maintenance on NFS lands. Concerns and conservation strategies for grizzly bears listed in the State Wildlife Conservation Strategy include reducing road related impacts, reducing human-bear conflicts due to attractants, and protection of important habitats.

Fuels reduction efforts are possible on all land ownerships, in particular where they are near residences. If these are done in such a way that they restore habitat that has been degraded by fire suppression, then habitat can be improved. If not, then habitat can be lost and connectivity impacted.

Climate change can possibly have varied impacts on grizzly bears and their habitats, especially when combined with fire (or fire suppression), insects, and disease effects on habitat. Past fire suppression has led to an increase in fuels, denser forests that are more susceptible to insects and disease, and forests that are less resilient and sustainable. Large, stand-replacing disturbance would be more likely under current conditions and may be exacerbated as the climate changes. A trend towards the desired condition for vegetation (FW-DC-VEG-01 through 06, FW-DC-VEG-10 and 11) in the revised Forest Plan would move stands closer to historic conditions and make them more resilient and sustainable. Climate change induced shifts in vegetation may impacts grizzly bear forage availability (page 91 in USDA 2010). Grizzly bears are generalists and eat a variety of foods, so it is difficult to determine the exact effects of climate change on the availability of different plant foods.

Border Patrol activities on the Forest have the potential to cause disturbance through use of roads or trails that are normally closed to motorized use. The exact extent/amount of the impact over the life of the Plan is difficult to predict because many factors could influence the amount and location of Border Patrol activity. Generally speaking, the likelihood of Border Patrol presence increases with decreasing distance from the border.

Recreation is likely to increase on all land ownership types, if for no other reason than human population growth. This would increase human disturbance and cause the portions of NFS lands that have lower human disturbance to become more important for grizzlies. Increased human presence on all land ownerships increases the chance of a human/bear conflict.

There is a segment of the human population that has developed a negative attitude towards bears that makes it difficult for them to coexist with bears. In some individuals that negative attitude towards bears may result in persecution of bears and possibly even poaching of bears.

Attitudes toward grizzly bears are associated with how humans view management actions (e.g. changes, in motorized vehicle access) implemented to benefit grizzly bears (Canepa et al. 2008). If viewed as a loss of “freedom” to use the national forest, the result may be a higher mortality risk for grizzly bears. Reducing motorized vehicle access may increase this type of attitude, which could result indirectly in higher bear mortality risk.

Black bear hunting on both sides of the international boundary within the SRZ and CYRZ has the potential to add cumulatively to illegal or mistaken identity mortality of grizzly bears within the cumulative effects area. The province of British Columbia and the States of Montana, Idaho, and Washington continue to allow hunting for black bears, as well as other wildlife species, on both sides of the border within and around the SRZ and CYRZ. Hunter encounters with grizzly bears may result in a bear death due to mistaken bear identification, self-defense, or opportunistic poaching. Changes in access availability with implementation of the Access

Amendment may influence habitat use and attendant mortality risk by reducing access within the United States portion of the SRZ and CYRZ.

Wildlife attractants on private lands can lure bears into conflict situation. This may be in the form of garbage, pet food, fruit trees, or others. Bears that become habituated or a nuisance may lead to the bear being killed. Additionally, the more a bear comes into contact with humans, the higher the likelihood that someone would poach that bear.

The Roads Management Policy (USDA 2001) directs the Forest Service to examine the road network and give priority to reconstructing and maintaining needed roads and decommissioning unneeded roads. It also directs the Forest Service in a similar manner under the 2005 Travel Management Rule (USDA 2005). This policy is complimentary to road management objectives in grizzly bear habitat and may serve as a method for implementing road management decisions.

Effects Determination

Each action alternative may affect, and is likely to adversely affect the grizzly bear.

Rationale for Determination: In spite of a general reduction in most allowable activities from current management direction, timber harvest (including thinning) and fire management activities, motorized access, road construction and reconstruction, and the low potential for mining, activities under the action alternatives—particularly in the General Forest MA—have the potential to adversely affect individual grizzly bears via increased human disturbance and displacement and habitat alternation. At the project level, all activities would be subject to existing plan components such as standards and guidelines designed to avoid or minimize adverse effects to individual grizzly bears and the habitats they occupy on Federal lands. Given that we cannot predict exact locations of future projects nor are there restrictions on the distribution of effects spatially or temporally, we cannot discount the potential for adverse effects to the grizzly bear.

Woodland caribou – Rangifer tarandus caribou

Affected Environment

Woodland caribou are identified as endangered on the IPNF. The only known population in the lower 48 states is located in the Selkirk Mountains of Idaho, Washington, and British Columbia, which is the recovery area for the species. Although the U.S. and British Columbia Forest Service are responsible for a majority of the caribou habitat, management of this caribou herd is a responsibility shared by many landowners including the state of Idaho Department of Lands, British Columbia Parks, and private landowners. In addition, Idaho Department of Fish and Game, Washington Department of Fish and Wildlife, British Columbia Fish and Wildlife Branch, Canadian Wildlife Service, and the United States Fish and Wildlife Service have management responsibilities for caribou although they do not directly control caribou habitat.

In 1971, the International Mountain Caribou Technical Committee (IMCTC) was formed to provide research and management recommendations for the Selkirk Mountains woodland caribou herd.

It is made up of an international, multi-agency group of researchers, biologists, resource managers, industry representatives, and other concerned people interested in recovering the endangered woodland caribou in the southern Purcell Mountains of British Columbia and the southern Selkirk Mountains of northeastern Washington, northern Idaho, and southern British Columbia. The USDA Forest Service is a cooperating agency member of this committee. This group provided the first habitat management guidelines for woodland caribou in 1976 (Johnson et al. 1977, 1981) which were later incorporated in the 1987 Idaho Panhandle Forest Plan (USDA Forest Service 1987, appendix N).

Habitat and Life History Needs

Research on the Selkirk population of woodland caribou has documented their preference for mature and old growth subalpine fir forests, while mature and old growth western red cedar and western hemlock forests generally above 4,500 feet elevation, and the ecotone between these two communities, have been identified as important early winter habitat, October through early January (Freddy 1974, Scott and Servheen 1985, Rominger and Oldemeyer 1989, Servheen and Lyon 1989, Allen 1998b, Kinley and Apps 2007). Woodland caribou are elevational migrants during the transition between seasonal habitats and do not demonstrate the extensive seasonal migrations associated with the barren ground caribou (*Rangifer tarandus groenlandicus*).

Arboreal lichens, especially the genus *Bryoria*, comprise a critical source of food for mountain caribou during the winter months (Freddy 1974, Scott and Servheen 1985, Rominger and Oldemeyer 1989, Rominger 1995, Allen 1998a, and MCTAC 2002). Woodland caribou are primarily grazers during the non-winter months, consuming grasses, carex, and juncus as well as a variety of forbs and shrub leaves (e.g., huckleberry and *Pachistima spp*.).

Woodland caribou have a very low reproduction rate with females usually giving birth to their first calf at three years of age. Single calves are the norm, and a cow will average six calves over her lifetime. Calf mortality is high for the first few months of life and can be as much as 50 percent or higher. This low reproductive rate is a major limiting factor to stabilizing or increasing woodland caribou populations (Paquet 1997).

Additional information on population ecology, biology, habitat description and relationships are described in the Woodland Caribou Recovery Plan (USDI Fish and Wildlife Service 1994), the USDI Fish and Wildlife Service (2008d) 5-Year Review, and final critical habitat rule (USDI Fish and Wildlife Service 2012). Local research efforts for the population include research by Allen (1998a, 1999), Almack (1998, 2000), Freddy (1974), Rominger and Oldemeyer (1989), Scott and Servheen (1984, 1985), Servheen and Lyon (1989), Wakkinen and Slone (2010), Warren et al. (1995) and annual winter census reports by Degroot and Wakkinen (2012), Degroot et al. (2011) and Wakkinen et al. (2008, 2009, 2010).

When woodland caribou were listed in 1984, hunting (legal and illegal), road collision mortality along B.C. Highway 3[1], and habitat modification by logging and fire were identified as factors affecting their conservation status (USDI Fish and Wildlife Service 1984). These threats have been addressed to varying degrees over time in the Selkirk woodland caribou ecosystem (USDI Fish and Wildlife Service 2008d). More recently, the FWS reevaluated the threats to woodland caribou and summarized six risk factors that the southern Selkirk population is facing (table 55) (Ibid).

[1] B.C. Highway 3 was completed in 1963 and is situated in the center of the southern Selkirk Mountain seasonal home range. It has been a chronic source of caribou mortality due to its proximity to occupied caribou habitat, winter time salting of the surface which attracts caribou, avalanche control activities, high traffic speeds, and limited winter time visibility.

Table 55. Six Risk Factors Potentially Affecting the Southern Selkirk Mountains Woodland Caribou Conservation (from USDI Fish and Wildlife Service 2008d)

WOODLAND CARIBOU RISK FACTORS
Past and Ongoing Habitat Destruction/Fragmentation
Mortality Due to Predation by Mountain Lions and Possible Wolves
Human Access
Inadequacy of Regulatory Mechanisms (e.g., timber harvest and motorized winter recreation on some lands)
Small Population Size
Climate Change

The FWS concluded that the major threats to woodland caribou in the Selkirk population at this time were past and ongoing habitat destruction/fragmentation, predation (by mountain lions and wolves), human access, inadequate regulatory mechanisms (to address timber harvest and winter recreation on some Federal, State and private lands), small population size, and potentially climate change (USDI Fish and Wildlife Service 2008d).

Habitat Alteration and Fragmentation: The FWS identified ongoing loss and fragmentation of contiguous old growth forests as the primary long-term threat to mountain caribou based on numerous studies in B.C. (i.e., Apps and McLellan 2006, Cichowski et al. 2004, MCTAC 2002, and Stevenson et al. 2001). Habitat loss and/or modification may have the following effects on caribou (from Cichowski et al. 2004 as stated in USDI Fish and Wildlife Service 2008d):

- Reduction in the carrying capacity of an area to support caribou by reducing the overall area available and food resources (i.e., arboreal lichens);
- Alternation of movement patterns which may affect the caribou's use of the remaining habitat as suitable habitat becomes smaller and more discontinuous; and
- Increase rates of predation as available habitat becomes more fragmented and compressed.

The FWS noted that "logging and wildfires have eliminated a significant amount of historic caribou habitat"…and…"the threat of habitat loss from wildfires is ongoing" (USDI Fish and Wildlife Service 2008d).

Mortality: Predation-caused mortality is considered to be one of the leading factors limiting woodland caribou recovery in the southern Selkirk population.

Other sources of mortality outside the action area and off NFS lands are deaths due to vehicular collisions along B.C. Highway 3. Mortality due to poaching or mistaken identity is not expected to significantly affect the Selkirk caribou population (Ibid).

Human (Motorized) Access: Motorized road access in caribou habitat could facilitate poaching opportunities, movement of predators within caribou habitat and result in vehicular collisions and death (i.e., B.C. Highway 3).

Another potential source of disturbance and displacement to woodland caribou includes increasing levels of winter recreation (e.g., snowmobiling, skiing). The FWS noted that snowmobiling within the recovery area is a growing threat to caribou with some efforts being made to address the issue on federal, provincial and some private lands, but no standards in place on state and many private lands (USDI Fish and Wildlife Service 2008d).

While not mentioned in their 2008 review, the FWS stated in 2001 that increasing summer (as well as winter) recreation pressure was decreasing habitat effectiveness for caribou in the Selkirk ecosystem (USDI Fish and Wildlife 2001). This is supported by observations in the field on transplanted caribou (Allen 1998a, Warren 1990).

Regulatory Mechanisms: As stated earlier, both habitat alternation/modification and motorized over-snow recreation are recognized as a threat to the recovery of woodland caribou. Inadequate regulatory mechanisms, particularly on state and private lands, may have significant negative effects on the ultimate recovery of woodland caribou (USDI Fish and Wildlife Service 2008d).

Small Population Size: The contracting range of the Selkirk woodland caribou population, the small number of animals in the population and the limited genetic exchange between this population and adjacent populations threatens their long-term population viability (Ibid).

Climate Change: Additionally, climate change can potentially alter the distribution and amounts of woodland caribou habitat by altering disturbance processes (i.e., fire regimes) and winter snowpack depths (Ibid).

Please see USDI Fish and Wildlife Service (2008d) for additional details regarding these six threats.

Critical Habitat, Caribou Management Units (CMUs) and Available Habitat

The Selkirk woodland caribou recovery area includes portions of the Colville National Forest in Washington, the northern portion of the IPNF, the Idaho Department of Lands, and a portion in British Columbia, Canada. The recovery area for caribou in the Selkirk Mountains is comprised of approximately 1,477 square miles in southern British Columbia, northeastern Washington and northern Idaho. Fifty-three percent of the recovery area is located in British Columbia, while the remaining 47 percent falls into the U.S. (table 56). Twenty-nine percent of the caribou habitat in the Selkirk recovery area and 61 percent of the caribou habitat in the U.S. portion of the Selkirk recovery area is on the IPNF. State and private lands are included within both recovery zones, with the recovery area incorporating 99 square miles of habitat on the Idaho Department of Lands.

Table 56. Existing Land Management Jurisdiction within the Woodland Caribou Recovery Area

Land Ownership Entity	Size & Percent of Total (Acres/%)
Idaho Panhandle National Forests	252,785/27
Colville National Forest	102,907/10
Idaho Department of Lands	61,882/7
U.S. Private[1]	27,713/3
British Columbia	501,112/53
Total	946,400

[1] Within the boundaries of the Colville NF=9,351; Idaho Panhandle NF=18,362 acres

Critical Habitat: The IPNF analysis area partially falls in designated critical woodland caribou habitat within the South Selkirk woodland caribou population (USDI Fish and Wildlife Service 2012a). This includes approximately 8,501 acres of designated critical habitat located in the extreme northeast corner of the IPNF.

The physical and biological features that are essential to the conservation of the species have been identified within the geographical area occupied by woodland caribou at the time of listing. These physical and biological features are the primary constituent elements (PCEs) laid out in a specific quantity and spatial arrangement to be essential to the conservation of the species. Based on this and the current knowledge of the life history, biology and ecology of the species, the PCEs for woodland caribou critical habitat is defined as follows:

- Mature to old-growth western hemlock/western red cedar climax forest, and subalpine fir/Engelmann spruce climax forest at least 5,000 feet in elevation with moderately open to closed canopies (>26 percent);
- Ridge tops and high-elevation basins that are generally 6,000 feet in elevation or higher, associated with mature to old stands of subalpine fir/Engelmann spruce climax forest, with relatively open (approximately 50 percent) canopy;
- Presence of arboreal hair lichens; and
- High-elevation benches and shallow slopes, secondary stream bottoms, riparian areas, and seeps, and subalpine meadows with succulent forbs and grasses, flowering plants, horntails, willow, huckleberry, dwarf birch, sedges and lichens;

Corridors/Transition zones that connect the habitats described above. If human activities occur, they do not impair the ability of caribou to use these areas.

CMUs: The recovery area is divided into areas known as Caribou Management Units (CMUs) to facilitate habitat evaluation within the ecosystem. Each CMU is approximately the size of the average home range of woodland caribou in the Selkirk Mountains (about 30 square miles or 19,200 acres) (USDA Forest Service 1985). These CMUS assist with analyzing and tracking cumulative effects (Ibid).

The U.S. portion of the recovery area is comprised of 17 CMUs, including 12 on the IPNF, four situated on the CNF, and one CMU located exclusively on the Idaho Department of Lands. Although a significant portion of the recovery area is located within B.C., CMUs have not been formally designated in B.C.

Potential impacts from Alternative B Modified will only address the 12 CMUs located within the action area.

Available Habitat: Seasonal habitat selection by mountain caribou is characterized by changes in elevation which is largely driven by access to available forage and the influence of snow conditions (Stevenson et al. 2001). The 1985 and 1994 Recovery Plans relied on the original research conducted by Idaho Fish and Game (Scott and Servheen 1985; Servheen and Lyon 1989) in identifying six seasonal habitats for the Selkirk population based on a combination of elevational shifts and behavior from 1983-1987 (i.e., early winter, late winter, spring, calving, summer, fall/rut[1]) (Scott and Servheen 1985, Servheen and Lyon 1989). A more recent analysis by Kinley and Apps (2007) identified just five based on distinct shifts in elevation use, with habitats occurring primarily within two vegetation zones: mature and older[2] western hemlock/western red cedar and subalpine fir/Engelmann spruce forests. Seasonal habitats are characterized as follows:

[1] Early winter (November 1 – January 15), later winter (January 16 – May 15), spring (May 16 – July 15), calving (June 2 – July 15), summer (July 16 – September 15) and fall (September 16 – October 31).
[2] The FWS defined mature and old growth as being older than 100-125 years (USDI Fish and Wildlife Service 2012a).

Early Winter: Early winter is a period of rapid snow accumulation and generally encompasses from October 17 to January 19 (Kinley and Apps 2007). Kinley and Apps (2007) reported that during this time caribou are often associated with landscapes dominated by spruce and subalpine fir stands with a forest canopy closure of at least 26-50 percent and strongly preferred old forest habitats. At a finer scale, Scott and Servheen (1984) found that during winter caribou selected stand conditions that minimized snow depth with dense canopies of 76-100 percent in old growth western hemlock/cedar forests with large, lichen bearing branches. Caribou seek out these more closed canopy timber stands where they feed on a combination of lichen on windthrown trees, and lichens that have fallen from standing trees (litterfall) (MCTAC 2002). If available, shrubs and other forbs that remain accessible in snow wells under large trees are also consumed. A conifer canopy that intercepts snow and allows access to feeding sites is important (MCTAC 2002) until the snowpack consolidates and the caribou can move to higher elevations (USDA Forest Service 2004). However, these elevational shifts can be quite variable within and between years, depending on snow levels (Apps et al. 2001, Kinley et al. 2007). All mountain caribou experience. Recently, Wakkinen and Slone (2010) identified the poorest mobility and food availability of any season during early winter because of the typically deep, soft snow (MCTAC 2002).

Late Winter: Late winter generally starts around January 19 and extends to about April 19 (Kinley and Apps, 2007). During this time, the snowpack is deep - up to 16 feet (or 5 meters) on ridge tops - and firm enough to support the animal's weight, which allows easier movement. These upper slopes and ridge tops are generally higher in elevation, support mature to old stands of subalpine fir and Engelmann spruce with preferred canopies similar to early winter at generally 26 to 50 percent cover (Kinley and Apps 2007), and have high levels of arboreal lichen (USDI Fish and Wildlife Service 1994, MCTAC 2002, USDI Fish and Wildlife Service 2008d). Late winter encompasses January 19 through April 19 in the Selkirk ecosystem (Wakkinen and Slone 2010).

Spring: In spring (April 20 – July 7), Selkirk caribou move to areas with green vegetation (Servheen and Lyon 1989, USDI Fish and Wildlife Service 1994), which become the primary food source. These areas often overlap with early and late winter ranges at elevations where new, green vegetation is appearing (Servheen and Lyon 1989, MCTAC 2002), which allows the animals to recover from the effects of winter (USDI Fish and Wildlife Service 1994).

Calving: Pregnant females will move to spring habitats for forage, but during the calving season from June 1 to July 7, the need to avoid predators influences habitat selection. Areas selected for calving are typically high elevation alpine ridgetops and non-forested areas in close proximity to old-growth forests, as well as high-elevation basins that can be food limited, but which may have much lower densities of predators (USDI Fish and Wildlife Service 1994, MCTAC 2002, Cichowski et al. 2004, Kinley and Apps 2007). Arboreal lichen becomes the primary food source for pregnant females and females with calves, since green forage is unavailable in these secluded and high-elevation habitats. Within in several weeks of birthing, cows with their calves begin moving to meadows to forage on more succulent greener vegetation while remaining in close proximity to escape cover on nearby ridges and benches.

Summer: July 8 to around October 16 is considered to be the summer habitat season for caribou. During this time, Kinley and Apps (2007) report that Selkirk caribou are associated with spruce and subalpine fir that also provides thermal cover, although summer habitat is in higher elevations with a preference for valleys (Kinley and Apps 2007), and habitat with high

> forage availability (USDI Fish and Wildlife Service 1994). In the Selkirk Mountains, the shallow slopes used in late summer are characteristically high elevation benches, secondary stream bottoms and riparian areas, and seeps where forage is lush and abundant (Servheen and Lyon 1989).

As part of the 1985 Recovery Plan and the IPNFs 1987 Forest Plan a cumulative effects submodel routine was developed to determine habitat suitability of woodland caribou habitat with the recovery area (USDI Forest Service 1985). Due to database and computer limitations at the time, the original habitat suitability Index (HSI) was not commonly used in project analysis. A stand-based habitat suitability index (HSI) and habitat capability index (HCI) was developed in 1993 and updated in 1998 based on stand-level use by radio-collared caribou (Allen and Deiter 1993, and Allen 1998). This model was used in an initial evaluation of much of the caribou habitat on the IPNF and IDL (Allen 1999, Allen 2001, USDA Forest Service 2004).

In 2007, a landscape level habitat priority model was developed to facilitate a unified assessment of caribou habitat throughout the Selkirk Recovery Area (Kinley and Apps 2007). The probability of habitat selection by caribou was categorized as high (0.7 to 0.99), moderate (0.3 to 0.69), and low (0.1 to 0.29) (ibid). This effort provided a statistically rigorous approach to habitat selection than the more simplistic, expert opinion derived HSI models (Antifeau 1998). However, this model is ecosystem-based and not intended for stand or drainage-level use (Kinley and Apps 2007) and was run using 2006 and older[1] vegetation data, making it less useful for project-specific land management analyses after 2007.

The FWS proposed critical habitat for the woodland caribou in 2011 and subsequently finalized it the following year (USDI Fish and Wildlife Service 2011c, 2012). As part of that process, the agency generally characterized woodland caribou habitat as mature and old-growth Engelmann spruce/subalpine fir (SAF) and western red cedar/western hemlock (CH) habitats. Accordingly, the Forest Service quantified woodland caribou habitat into three age categories (0-99, 100-150, and 151+ years old) and three dominate cover types (SAF, CH, CH/Other[2]) to provide an up-to-date (2011) estimate of available caribou habitat on the IPNF by CMU regardless of fixed topographical features (i.e., slope, elevation, aspect) that may also influence seasonal habitat selection. This approach is more useful when discussing potential affects due to land management activities on habitat (e.g., timber harvest, prescribed burning) because of its simplicity and emphasis on existing vegetation conditions in terms of cover type and stand age[3]. Table 57 is a summary of available forested woodland caribou habitat on the IPNF as of 2011.

Currently, the majority of SAF, CH, and CH/Other habitat within the recovery area is greater than 100 years old, and these habitats are well distributed throughout the designated CMUs (table 57). Habitat is not considered to be limiting the growth of this population at this time (USDI Fish and Wildlife Service 2008d).

Designated critical habitat is only found in the Big Snowy CMU (Total acres=8,501) within the action area. This includes a total of 6,508 and 1,006 acres of SAF and CH habitats, respectively, and is dominated by older age classes (>100 years old=66 percent). Another 987 acres is comprised of non-forested high-elevation habitat.

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[1] The model was developed and run by a B.C. consulting firm and the USFS does not have the capability to rerun the analysis using more recent data.
[2] "CH/Other" category represents cedar/hemlock habitat types and a combination of cedar, hemlock, lodgepole, Douglas fir, white fir, western larch cover types which may/may not provide the characteristics associated with mature and old growth cedar/hemlock stands used by woodland caribou during the early winter period.
[3] Stand age is a useful predictor of arboreal lichen abundance (Stevenson et al. 2001).

Table 57. Woodland Caribou Habitat by Caribou Management Unit, General Cover Type and Stand Age on the Idaho Panhandle National Forest, 2012

Caribou Management Unit (CMU)	Size of CMU (Acres)	Spruce/Subalpine Fir[1]			Cedar/Hemlock			CH/Other[2]			Total Forested Caribou Habitat (Acres)
		Age			Age			Age			
		<100	100-149	>150	<100	100-149	>150	<100	100-149	>150	
Big Snowy[3]	24,762	2,318	5,099	0	3,585	8,001	33	1,393	2,253	0	22,682
Cow	24,975	4,805	3,484	2,022	478	967	1,197	5,856	1,763	854	21,426
Grass	26,160	4,210	5,207	1,440	135	829	1,323	4,145	4,277	1,027	22,593
Grassy Top	16,558	4,615	556	0	1,008	487	0	6,250	297	0	13,213
Gold	21,856	1,539	2,054	0	2,409	6,829	0	5,131	1,397	0	19,359
Long	31,186	4,446	9,601	6,390	236	769	1,328	1,184	1,767	968	26,689
Myrtle	21,992	1,213	1,933	6,500	244	180	912	2,103	851	1,151	15,087
Pack River	19,566	4,192	4,354	511	8	216	0	2,242	1,271	0	12,794
Smith	22,517	2,678	1,458	4,071	525	297	1,128	1,198	918	1,099	13,372
Snow	19,953	3,074	1,730	21	146	306	0	2,684	1,014	0	8,975
Trout-Ball	25,703	2,983	4,847	8,285	18	434	702	1,235	1,241	1,790	21,535
Upper Priest	16,825	1,511	249	930	1,511	3,696	3,396	1,403	1,099	861	14,656
Total	**272,053**	**37,584**	**40,572**	**30,170**	**10,303**	**23,011**	**10,019**	**34,824**	**18,148**	**7,750**	**212,381**

[1] Includes whitebark pine dominated high elevation sites

[2] Other category represents cedar/hemlock habitat types with a combination of cedar, hemlock, lodgepole, Douglas fir, white fir, western larch cover types which may/may not provide the characteristics associated with mature and old growth cedar/hemlock stands used by woodland caribou during the early winter period

[3] Big Snowy is the only CMU on the IPNF that contains designated critical habitat. This includes a total of 6,508 and 1,006 acres of SAF and CH habitats, respectively. These habitats are dominated by older age classes (>100 years old=66 percent). Another 987 acres is comprised of non-forested high-elevation habitat

Linkages and Movement

Ensuring connectivity between existing woodland caribou core use areas in B.C. and suitable habitats in the United States is important for maintaining demographic stability, and ultimately achieving the recovery plan goal of having a herd or subpopulation in the United States. Identification of potential linkages must take into account both temporal and spatial aspects of caribou behavior. The 1987 Forest Plan included direction for the “retention and management of established caribou travel corridors that occur in mature timber” (USDA Forest Service 1987). Regional forest management prescriptions in British Columbia also support maintenance of movement corridors (MCTAC 2002). Specifically, the Kootenay Boundary Land Use Plan which covers the South Selkirks, includes direction to “maintain continuous broad corridors of old-growth and mature at regular intervals to connect pockets of old growth forest” (ibid).

“Established” travel corridors have never been formally identified for the Selkirk caribou population, although Freddy (1979) identified routes in British Columbia that south Selkirk woodland caribou used repeatedly. His research indicated that caribou “consistently followed specific travel routes between and within drainages…Routes commonly incorporated natural passes along ridges, frequently followed stream bottoms, invariably proceeded through forested areas, and generally connected feeding and resting areas used by caribou. Most routes were utilized during all seasons.” In terms of movement across the international border, he documented caribou travel from Kootenay Pass (B.C.) southward to Snowy Top Mountain, as well as movement from Monk Creek and Nun Creek (B.C.) to Continental Mountain via the Upper Priest River/American Falls drainage at about 4,000 feet elevation, and presented likely movement routes based on historical information as well (Freddy 1974).

More recently, Wakkinen and Slone (2010) examined 20 years of Selkirk caribou radio telemetry data (1987 to 2006) in tandem with the landscape habitat model (Kinley and Apps 2007) to examine potential caribou movement corridors. They mapped 12 potential movement corridors from one area of high quality habitat to the next. Seven of these are located within the Action Area. Factors which may influence the overall effectiveness and utility of these modeled potential travel corridors by caribou movements include: (1) the presence of roads—particularly roads receiving frequent and high speed vehicular traffic which may influence caribou movements and survival year-round (i.e., B.C. Highway 3 through Stagleap Park and core caribou habitats)(Johnson 1976, Freddy 1979, Johnson 1985, USDI Fish and Wildlife Service 1994); (2) early seral vegetation conditions (due to timber harvest or large stand-replacing burns) which may impede movements across the landscape if the area is large enough and habitat quality is limited (Simpson et al. 1997, Heard and Vagt 1998) and associated higher rates of predation (Wittmer et al. 2007); (3) topographic features, including steep cliff faces[1] and avalanche prone slopes (Scott and Servheen 1985, Servheen and Lyon 1989), and (4) recreational activities, including snowmobile activity which may influence caribou movements during the winter season (Simpson 1987, Simpson and Terry 2000).

Current Management for Woodland Caribou

Currently, management of woodland caribou habitat on the IPNF is dictated by the 1987 Forest Plan (USDA Forest Service 1987) MA direction and the 2008 IRR. Tables 58 and 59 disclose the existing distribution of habitat under the 1987 Plan MA direction and the allowable activities and uses within identified woodland caribou habitat per the 1987 Plan MA direction and the 2008 IRR. Specific Forest Plan desired future condition for caribou included the following:

[1] The Selkirk woodland caribou population tends to use gentle (< 30 percent) slopes.

- Caribou habitat will be maintained and improved. Caribou habitat will be provided by maintaining a balance of seasonal habitats. These seasonal requirement may require vegetation manipulation to maintain the require balance. Habitat for caribou will be managed to support the IPNF share of recovered populations, as per the Recovery Plan for the species.

Additionally, 58 and 96 percent of the woodland caribou recovery area overlaps with the Selkirk LAUs and BMUs, respectively. The standards and guidelines in the NRLMD (USDA Forest Service 2007) and the design elements in the Access Amendment (USDA Forest Service 2011b and 2011c) provide additional direction and limits in regards to vegetation treatments for lynx and motorized access for grizzly bears that may affect caribou habitat.

The majority of woodland caribou in the U.S. is managed by the Forest Service under the guidance of forestwide standards and habitat management guidelines included in the 1987 Forest Plan. Relevant forestwide standards for woodland caribou include:

- Management of habitat and security needs for threatened and endanger species will be given priority in identified habitat;
- Actively initiate and participate in an information/education program to promote a better understanding of endangered species conservation and recovery both within and outside the Forest Service; and
- Consider cumulative effects when evaluating activities within identified habitat.

Caribou Management Area (MA7) Specific Standards

- Manage for roaded natural and where possible toward semi-primitive motorized and non-motorized recreation. Restrict motorized use when needed to protect caribou;
- Seasonal closures of some or all uses may be needed to protect caribou;
- Retain and manage established caribou travel corridors that occur in mature timber;
- Collector and local roads generally closed to vehicles with physical barriers preferred. Arterial roads may be closed as need to meet threshold level for each CMU Additional seasonal closures as needed to protect caribou;
- Contain and control fires within the management area to prevent loss of coniferous species in all size classes;
- Road construction through old-growth cedar/hemlock stands should be limited to those instances in which no other reasonable access to stands to be harvested is available. Snow roads are encouraged where possible; and
- Provide seasonal habitat requirements in accordance with the Caribou Management Guidelines (appendix N, USDA Forest Service 1987). These guidelines are used for preparation of silvicultural prescriptions necessary to provide seasonal habitat within identified caribou habitat.

Table 58. Woodland Caribou Habitat on NFS Lands by Existing (i.e., 1987 Forest Plan) Management Area Direction

Existing Condition (1987 Forest Plan) Management Areas (MAs)	Woodland Caribou Habitat (Acres)				Non-Habitat
	Forested Habitat by Habitat & Cover Type		Non-Forested Habitats[1]	Critical Habitat	Other Forested Areas
	SAF	CH/Other			
1 - Timber Production	593	2,742	616	155	1,036
2 - Timber Production within Grizzly Bear habitat	72	5,235	46	0	840
3 - Timber Production in Grizzly Bear & Big Game	0	183	0	0	0
4 - Timber Production within Big Game Winter Range	0	59	26	0	24
5 - Big Game Winter Range	0	0	0	0	0
6 - Timber Production within Elk Summer Range	0	0	0	0	0
7 - Caribou Management	41,876	63,774	2,432	0	11,229
9 - Non-Forest lands, lands non-suited	21,232	5,007	5,934	0	3,062
10 - Semi-primitive Recreation	18,332	5,879	3,160	0	2,123
11 - Existing and Proposed Wilderness	19,639	15,835	9,204	8,346	2,287
12 - Wild and Scenic River Systems	15	3,666	51	0	6
13 - Special Interest Areas	0	0	0	0	19
14 - RNA	346	613	143	0	0
15 - Primary Range[2]	0	0	0	0	0
16 – Riparian[2]	0	0	0	0	0
17 - Developed Recreation Sites	0	0	0	0	0
18 - Administrative Sites[2]	0	0	0	0	0
19 - Semi-primitive/Timber Production	0	0	0	0	0
20 - Semi-primitive unroaded w/ limited timber harvest	0	0	0	0	0
Total	**102,105**	**102,993**	**21,612**	**8,501**	**20,626**

[1] Includes all acres on NFS lands within the recovery area such as high elevation non-forested areas, meadows, and rock/scree areas

[2] Not mapped as an MA

Table 59. Woodland Caribou Habitat by Allowable Uses and Activities under Existing (1987 Forest Plan) Management Area Direction and the Idaho Roadless Rule (2008)

	Woodland Caribou Habitat				Non-Habitat
	Forested Habitat by Habitat and Cover Type		Non-Forested Habitats[1]	Critical Habitat	Other Forested Areas
	SAF	CH/Other			
	Acres (%)				
Timber Harvest	67,101 (66)	81,679 (79)	NA	155	16,860 (82)
Timber Production	27,522 (27)	67,127 (65)	NA	0	11,663 (57)
Commercial Use – Special Products & Firewood	102,105 (100)	102,993 (100)	21,612 (100)	8,501 (100)	20,626 (100)
Personal Use – Special Forest Products & Firewood	102,105 (100)	102,993 (100)	21,612 (100)	8,501 (100)	20,626 (100)
Planned Fire Ignition	101,759 (100)	102,380 (99)	21,612 (100)	8,501 (100)	20,626 (100)
Natural, Unplanned Fire Ignitions to meet Resource Objectives	19,639 (19)	15,835 (15)	9,204 (43)	8,191 (96)	2,287 (11)
Grazing	82,466[2] (81)	87,158[2](85)	12,408(12)	0	18,333 (89)
Motor Vehicle	81,322 (80)	93,795 (91)	17,911 (83)	8,501 (100)	19,626 (95)
Over-snow Motor Vehicle	81,322 (80)	93,795 (91)	17,911 (83)	8,501 (100)	19,626 (95)
Road Construction (permanent or temporary)	61,115 (60)	87,228 (85)	12,406 (57)	0	16,060 (78)
Minerals – Leasable	26,134 (26)	12,678 (12)	7,756 (36)	0	4,871 (24)
Minerals - Materials	83,427 (82)	96,501 (94)	18,309 (85)	8,501 (100)	18,503 (90)

The magnitude of actual use and activity is regulated by the 2007 NRLM and the 2011 Access Amendment standards (USDA Forest Service 2011) as well as other management direction and available budgets

[1] Includes all acres on NFS lands within the recovery area such as high elevation non-forested areas, meadows, and rock/scree areas

No increase in livestock operations is allowed in MA 2 and MA3 under the 1987 Forest Plan direction for grizzly bears. This includes another 71 acres of SAF and 5,518 acres of CH/Other

One CMU (63,450 acres) is managed primary for timber production by the Idaho Department of Lands (IDL). IDL received financial assistance in 2003 to develop a Habitat Conservation Plan (HCP) that would protect caribou and other listed species on their lands (USDI Fish and Wildlife Service 2003a). The HCP is not completed at this time. Currently, there are no regulatory mechanisms addressing caribou habitat management and/or protection on private lands within the U.S., while B.C. has regulatory mechanisms in place on Provincial and some private land within the recovery area.

The 2012 final rule described four types of actions that may adversely affect designated critical habitat (USDI Fish and Wildlife Service 2012). These are:

- Actions that would reduce or remove mature old-growth vegetation (greater than 100-125 years old) within the cedar/hemlock zone and subalpine fir/Engelmann spruce zone at higher elevations stands (at or greater than 5,000 feet , including the ecotone between these two forest habitats. Such activities could include, but are not limited to, forest stand thinning, timber harvest, and fuels treatment of forest stands. These activities could significantly reduce the abundance of arboreal lichen habitat, such that the landscape's ability to produce adequate densities of arboreal lichen to support persistent mountain caribou populations is at least temporarily diminished;

- Actions that would cause permanent loss or conversion of old-growth coniferous forest on a scale proportionate to the large landscape used by the southern Selkirk woodland caribou population. Such activities could include, but are not limited to, recreational area developments, certain types of mining activities (e.g., open-pit mining), and road construction. Such activities could eliminate and fragment mountain caribou and arboreal lichen habitat;
- Actions that would increase traffic volume and speed on roads within the Selkirk Mountains caribou population. Such activities could include, but are not limited to, transportation projects to upgrade roads or development, or development of a new tourist destination. These activities could reduce connectivity within the old-growth coniferous forest landscape for woodland caribou; and
- Actions that would increase recreation in critical habitat. Such activities could include recreational developments that facilitate winter access into mountain caribou habitat units, or management activities that increase recreational activities within designated critical habitat throughout the year, such as snowmobiling, OHV use, and backcountry skiing. These activities have the potential to displace the southern Selkirk Mountain woodland caribou population from suitable habitat or increase their susceptibility to predation. Displacement may result in: (1) additional energy expenditure when they vacate an area to avoid disturbance; (2) an effective temporary loss of available habitat, and (3) potential long-term habitat loss if they abandon areas affected by chronic disturbance.

Key Stressors Affecting Woodland Caribou

Of the management activities allowed under the action alternatives, habitat reduction/fragmentation via timber harvest, fire (planned, unplanned, and suppression), mineral extraction, motorized access and associated road construction are the key stressors to woodland caribou.

Timber Harvest: The mountain ecotype of woodland caribou are closely tied to later successional coniferous forests in British Columbia and the U.S. and their survival depends on their ability to spread out over large areas of suitable habitat where it is difficult for predators to find them. Consequently, timber cutting activities that result in the removal of older subalpine fir and/or cedar-hemlock stands within the recovery area are a concern.

As stated earlier, timber cutting activities typically modify vegetation structure and composition, which can have the following impacts on the quality and quantity of caribou habitat:) a reduction in arboreal lichens, the caribou's key winter food source; 2) alteration of caribou migration and habitat use patterns, particularly where old growth forests are fragmented; and 3) increased predation risk where security cover has been removed or modified. Timber harvest can have adverse effects on critical habitat.

The 1987 Forest Plan included direction on maintaining seasonal habitats in accordance with silvicultural prescriptions. These guidelines were originally developed based on professional input and endorsement from the IMCTC in the 1970s (Johnson et al. 1977, 1981) However, researchers in B.C. have been investigating the use of various silvicultural practices (e.g., partial cutting) and habitat enhancement techniques that could protect and/or enhance caribou habitat while allowing some level of timber harvest since the 1980s. Stevenson et al. (2001) summarized their findings.

Fire (suppression, natural ignitions, and planned ignitions): In general, fire exclusion throughout the western U.S. over the past 50 to 100 years has substantially altered the natural succession of many forested ecosystems, whereas early successional forest stages have been reduced or eliminated (Lee and Jonkel 1981, Zager 1980, as cited in IGBC 1987). Where the fire regime has been interrupted, forested stands may be more susceptible to uncharacteristic, stand-replacing fire events where there has been significant fuel buildup. At a landscape scale, stand-replacing fire could change the configuration and availability of forested stands which affects the cover and security these stands provide caribou from predators, human disturbance, and the elements (Courtois et al. 2007, Shepherd et al. 2007). Impacts of wildfire on caribou habitat have been identified as a concern in the Recovery Plan for the species (USDI Fish and Wildlife Service 1994). To avoid such impacts, the judicious use of planned and management of unplanned ignitions would assist in protecting and/or restoring caribou habitat in the long-term with the understanding that short-term impacts to forage availability may occur.

Use of fire in forested ecosystems has the potential to affect woodland caribou through a number of mechanisms. At the site-specific scale, fire may alter the vegetation composition and abundance within caribou habitat, including arboreal lichens, the primary food source for caribou through the winter months. Caribou habitat that has burned in wildfire experiences a short-term reduction in suitability where arboreal lichens have burned or are less accessible due to increased snow accumulations where crown cover has burned (Metsaranta et al. 2003). Fire can also contribute to increased deadfall in forested stands, which may impede travel by caribou (ibid). Looking over longer time frames, fire appears to stimulate forage growth, particularly in the 40 years following a fire event, which may result in improved habitat conditions for caribou in the long term.

Mineral Extraction Activities: Generally, the impacts of mining on terrestrial wildlife species, including woodland caribou, result from the habitat loss and degradation from the footprint of the mining operation, required infrastructure (i.e. road construction and development), and the human disturbance where individuals are displaced from key habitats.

Road Construction and Motorized Access: In general, woodland caribou appear relatively sensitive to the effects of roads, particularly the activities they facilitate. Roads contribute to changes in habitat quality and availability by fragmenting habitats in previously intact landscapes. As road densities increase, edge habitats increase and interior patches decrease, reducing habitat available to species requiring interior habitats. As fragmentation increases, patches of remaining habitat may become sufficiently small in size and/or isolated to the point that they are no longer be used these wildlife species, thus resulting in effective habitat loss. This has been demonstrated in numerous species, including woodland caribou (Joly et al. 2006). Roads the result in the creation of new non-motorized trails that access preferred caribou summer ranges also have the potential to negatively affect caribou (Dumont 1993). Conversely, some roads may facilitate hunter access, which can help moderate predator populations (Apps et al. 2013, Hayden et al. 2007, Hayden and L. Allen 05/24/2013 pers. comm).

Reduced use of habitat in response to roads has been exhibited in numerous ungulate species, including woodland caribou. Woodland caribou can be displaced from important habitats like calving grounds (Joly et al. 2006) due to their avoidance of roads (Dyer et al. 2002). Weir et al. (2007) documented avoidance by caribou in response to construction and operation of a mine during five seasons, illustrating the exceptional sensitivity of caribou to anthropogenic activities. Apps and McLellan (2006) found that 'remoteness from human presence, low road densities, and limited motorized access' were important factors in explaining habitat occupancy in current caribou subpopulations.

Motorized Over-snow Access: Early and late winter is a time of high energy expenditure and potential stress for woodland caribou due to increasing snowfall and the shift from herbaceous forage to arboreal lichens (Rominger and Oldemeyer 1989, Servheen and Lyon 1989). Management activities that may negatively impact caribou during this time period include motorized and non-motorized recreation, with the snowmobiling identified as a key stressor for the species.

Snowmobiling activities have the potential to displace caribou from suitable habitat, resulting in additional energy expenditure by caribou when they vacate an area to avoid disturbance (Tyler 1991). This results in an effective loss of habitat availability temporarily, and potentially for the long term if caribou abandon areas characterized by chronic disturbance. Simpson (1987) concluded that large groups of fast moving snow-mobile machines in combination with human scent caused mountain caribou to abandon an area previously used as winter habitat. Seip (2007) reported similar adverse effects of snowmobiling on caribou where abandonment of high quality habitat could not be explained by habitat conditions alone. It has also been suggested that snowmobile trails provide hard packed travel corridors for predators, like wolves, to move into the alpine (Bloomfield 1979, Neumann and Merriam 1972). Wolf predation is often responsible for adult mortality and low recruitment in caribou populations within Canada (Bergerud and Ballard 1988, Gasaway et al. 1983, Seip 1991) but this has not been documented as a significant problem in the Southern Selkirk population.

Past and Ongoing Impacts Associated with Key Stressors

Timber Harvest, Unplanned/Planned Fire Ignitions and Fire Suppression: Except for some documented spring habitat use (Scott and Servheen 1985, Servheen and Lyon 1989), seral forested communities—which historically originated from wildfires and insect and disease outbreaks—do not provide habitat for woodland caribou. Currently, more than 61 percent of all caribou habitat types that are capable of growing trees are 100 years or older (SAF=65 percent; CH/Other=57 percent). Wildfire and the impact of insects and disease continue to be the primary factors affecting changes in caribou habitat conditions, as there have been essentially no changes to caribou habitat on NFS lands in the past 20 years as a result of timber harvest on NFS lands[1].

In spite of fire suppression efforts, sixteen wildfires[2] have occurred on NFS lands within the recovery area boundary since 1988, resulting in mixed-severity or stand-replacing effects to approximately 7,700 acres of caribou habitat. This includes nine natural ignitions in critical habitat that burned approximately 2,170 acres. To put this in perspective, site-specific landscape analyses of changes in vegetation over time demonstrate an increase and/or maintenance in the amount and distribution of larger size classes of subalpine fir and moist, mixed-conifer (cedar, hemlock, grand fir, and larch forest) as the ecosystem recovered from large wildfires from 1880 to 1890 and 1910 to 1946 (Allen 1999, USDA Forest Service 2000, USDA Forest Service fire

[1] Prior to 1987, the Forest Service completed approximately 7,100 acres of stand replacing timber harvest within the caribou recovery area. Since 1987, there is been less than 5,400 acres of timber harvest on the IPNF and these treatments were designed to move unsuitable habitat conditions towards suitable habitat.
[2] Only fires greater than four acres in size were considered. Average fire size was less than 480 acres but not all of the acres were located in quality caribou habitat.

history maps)[1]. This goes counter to the argument that wildfires has eliminated a great deal of mature and older caribou habitat in recent decades[2], and suggests an overall pattern of recovery from fires in the late 1800's for a large portion of the Southern Selkirk recovery area in the U.S.

Most prescribed burning within the caribou recovery area been associated with post-harvest treatments although in recent years there has been several wildlife-oriented burns conducted on dry-site habitats at lower elevations and another landscape burn to benefit whitebark pine. Since 2000, the IPNF has conducted 17 prescribed fire operations and burned approximately 640 acres within five CMUs in the recovery area. None of these occurred in critical habitat.

Minerals (Locatable and Materials): There are no major mining operations on the IPNF at this time. There are currently 1,232 Plans of Operations for locatable minerals on the IPNF. Of these, three are located in cedar/hemlock habitat types in the woodland caribou recovery area. The majority of on-going activities are related to maintenance of existing facilities. Most locatable mineral operations are less than five acres in size. Potential for future mineral discovery is considered "low."

There are approximately 434 active mineral material pits and quarries within the IPNF and of these two sites are located in the caribou recovery area. Sites are typically from less than one acre to five acres in size. Neither is located in critical habitat.

There are no leasable minerals located on the IPNF at this time and potential is considered "low."

Motorized Routes: Controlling and/or managing motorized access improves woodland caribou use by reducing the risk of disturbance, displacement and mortality.

The majority of the woodland caribou habitat on the IPNFs (i.e., 96 percent) is also within the Selkirk grizzly bear recovery zone and caribou are afforded the security provided for bears in this recovery area. Motor vehicle access management strategies for grizzly bear were analyzed during completion of the Access Amendment and will result in lower levels of motorized vehicle (excluding over-snow vehicle) access and an increase in the amount of core (secure) habitat which in turn would provide higher levels of security for caribou (USDA Forest Service 2011b and 2011c). More specifically, approximately 55,400 acres of secure habitat (i.e. devoid of motorized routes) has been created within the caribou recovery zone on NFS lands from the mid-1980s to 2009 (ibid). However, motorized routes do provide access to non-motorized trailheads in the Selkirks, with hiking trails constructed/maintained to 90 percent of the high elevation lakes, meadows and basins. These areas represent preferred summer range for woodland caribou. Currently, there are approximately 190 miles of road located within the woodland caribou recovery area, and many of these are located behind gates closed to public use (table 60). There are no roads located in critical habitat.

Additionally, there are 30 miles of groomed routes and designated over-snow routes located within the caribou recovery area. Off-route use occurs on approximately 23,313 acres within the

[1] Of the habitat that is less than 100 years old, approximately 70,329 acres of immature habitat was the result of wildfires that occurred after 1911.

[2] The 1967 Trapper Creek burn is the largest fire to burn within the recovery area in recent decades. It burned approximately 7,600 acres of spruce/fir and 1,500 acres of cedar/hemlock habitat on NFS lands. This fire event currently provides important early seral habitat for grizzly bears (i.e., extensive huckleberry shrub fields (Volsen 1994)).

entire recovery area (table 60). There are no groomed routes, designated over-snow routes or use areas located in critical habitat.

Table 60. Current Motorized Over-snow Access within the Woodland Caribou Recovery Area on the IPNF

Type of Allowable Access[1]	Non-Habitat in the Recovery Area	Woodland Caribou Habitat			Critical Habitat
		Non-Forested	High Elevation Spruce/Fir	Low Elevation Cedar/Hemlock	
Motorized Access Routes (miles)	25	1	24	141	0
Groomed & Designated Over-snow Routes (miles)	2	0	3	25	0
Over-snow Motorized Use (acres) [2]	2,212	3,620	10,554	6,925	0

[1] The Selkirk recovery area includes the 2007 federal court order to protect caribou. It will be lifted once winter travel planning is complete

[2] Includes all acres on NFS lands within recovery area including high elevation non-forested areas, meadows, and dry-site forested areas

[3] Many of these areas have limited accessibility for snowmobiling off-route due to tree densities and topography

Beginning in 1993, the IPNF implemented site-specific motorized over-snow closures to protect caribou on the Forest. In 2007, a protective closure (Court Order NO. CV-05-0248-RHW) was put in place within portions of the recovery area and is considered in the current environmental baseline for the action area. This closure order limits motorized over-snow vehicle access within NFS lands until a Winter Travel Plan is completed. A Winter Travel Plan for the Selkirk Mountains is in currently in progress with completion anticipated in the next two-to-four years.

Other On-Going Activities within the Project Area

Livestock Grazing: Cattle grazing is currently permitted in two allotments that overlap CMUs on the Forest. Under current direction, there is no opportunity to increase the number of allotments in MA2 and MA3 in support of grizzly bear recovery. Much of the area where cattle grazing occurs in located in-and-around the 1967 Trapper Creek burn in the Cow, Beaver, and Grass Creek drainages. Grazing is typically centered in the lower elevation meadows of these areas (below 4,500 feet). As this area recovers and the amount of transitory range decreases, AUMs will need to be adjusted downward.

Both woodland caribou (during the spring/summer/fall months) and domestic cattle are primarily grazers. In theory, this presents the possibility of forage competition between caribou and cattle during the summer months and the risk of noxious weed infestation of high elevation meadow complexes. However, given the low number of cattle on the allotments, the low level of likely overlap between the two in the summer months, and the existing lack of caribou residing in these drainages the risk of competition is considered negligible. However, the risk of noxious weed infestation remains. Both allotments include several miles of drift fencing. Shorter sections of fence are not considered an impediment to caribou movement, but longer sections may impede travel and contribute to caribou mortality. In the mid-1990s a dead bull caribou was found tangled in a single strand of smooth wire fence within the Beaver Creek pasture of the Cow Creek allotment.

Recreational Activities: The IPNF is easily accessed and has a growing and changing visitor base. Most of the visitation is local with strong ties to the Forest. Traditional uses include hiking, hunting, fishing, gathering, biking, water-based camping, and boating. Winter activities are snow dependent and focus on snowmobiling. Outdoor recreation is the fastest growing use within the national forest and it is a use that is expected to increase in the future. Since the 1980, both motorized and non-motorized recreation use of the roads, trails, and general forest areas have increased. Foot, horse, and mountain bike travel have increased, and to a lesser degree, cross-country and backcountry skiing and receive use as well.

High elevation basins that include meadows and riparian areas are preferred habitat by woodland caribou. Such areas are often snow-free earlier in the season, provide good visibility, and include an abundance of arboreal lichen, grasses, and forbs. This makes them ideal habitat for caribou in general, and especially cows with calves. These areas also provide some of the most popular recreation destinations for backpacking, hiking and camping from July through October, with significantly increasing human use observed over the last two decades due to publicity from local advertisement and guide books. Dumont (1993) noted that interactions between caribou and hikers on preferred summer range likely increases caribou susceptibility to predation by pushing caribou into areas of reduced visibility.

Hunting in the United States and Canada: The province of British Columbia and the states of Idaho, and Washington continue to allow hunting for big game on both sides of the border within-and-around the recovery area.

Special Use Permits (SUPs) and Agreements: Special use authorizations permit occupancy and use on NFS lands by federal, state and locate agencies, private industry, and individuals. Recreation special use permits are of particular interest in evaluating effects to caribou due to their proximity to caribou habitat and their potential to generate some level of disturbance or displacement. The IPNF currently has 190 recreation Special Use Permits and agreements (see the “Access and Recreation” section). This includes three resorts that operate in the Priest Lake area and have winter-time operations on NFS lands.

There are seven challenge-cost share agreements that permit winter grooming of snowmobile trails on the IPNF, and two of these are located in woodland caribou habitat. Outfitter and Guides also operate on NFS lands under special use permit. Two outfitter and guides operate within the woodland caribou recovery area on the IPNF, and both are allowed to use snowmobiles as part of their permit. None of these are located in critical habitat. The permitting of special uses would not be changed with implementation of the Action Alternatives.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Habitat Alteration: Across the entire IPNF, Alternative C (11,031 acres/year) would have the most active restoration followed by Alternatives B Modified (9,465 acres/year), and D (7,912 acres/year) under constrained budgets. Alternative A would treat 10,867 acres/year. With an unconstrained budget, Alternative B Modified (14,190 acres/year) would have the most active restoration followed by Alternatives C (13,195 acres/year) and D (10,790 acres/year). Alternative A would treat 11,537 acres/year.

Caribou habitat is not currently limiting. Non-caribou habitat adjacent to caribou habitat may be maintained or restored, depending on whether it is outside of historic conditions. The revised Forest Plan would maintain old growth and manage vegetation towards a desired condition based on historic conditions (FW-DC-VEG-01 through 03, FW-DC-VEG-05, FW-DC-VEG-11, FW-STD-VEG-01, and FW-GDL-VEG-01 and 02). FW-DC-FIRE-03 would be implemented to allow fire to play a more natural role in the ecosystem. Combined, the desired conditions for vegetation and FW-DC-FIRE-03 would maintain caribou habitat and natural disturbance processes similar to the conditions that caribou evolved with in this ecosystem.

Past fire suppression has led to increased fuels, both ladder fuels and snags/downed wood as trees are killed due to insects and disease. As stand densities increase and trees become stressed due to competition for resources, then the likelihood of insects and disease increases. The patch size of a stand replacing fire under those conditions may be larger than what would have occurred historically. Although caribou habitat is not limiting and may have typically had stand replacing fire, there would potentially be a higher likelihood of a fire starting in non-caribou habitat and burning into caribou habitat. Fuels reduction, mainly in the lower elevation non-caribou habitat, would reduce the chance of a large, stand replacing fire starting there and burning into caribou habitat. Additionally, passive restoration/maintenance (utilizing natural fire for resource management) may have both positive and negative impacts on caribou habitat. In the short term, fires may burn currently suitable habitat. However, if caribou habitat naturally had stand-replacing fire, then loss of some habitat to fire would be normal and useful for creating a mosaic and future habitat. In the long term, maintaining or restoring natural disturbance processes would maintain caribou habitat in a condition within historic conditions (FW-DC-FIRE-03). Conditions within historic conditions (FW-DC-VEG-01 through 03, FW-DC-VEG-05, FW-DC-VEG-11, FW-STD-VEG-01, and FW-GDL-VEG-01 and 02) would be more sustainable and resilient to large-scale disturbance.

Timber harvest has not occurred often in the recent past in caribou habitat[1]. It would be possible that timber harvest may be a tool to maintain habitat or mimic natural disturbance processes. It would be more likely that timber harvest would be used as a restoration tool in non-caribou habitat that is outside of historic conditions. When done as part of a fuels reduction effort in non-caribou habitat, then it may aid in maintaining the natural disturbance processes in caribou habitat. It would do so by reducing the likelihood of a large scale stand replacing fire starting in non-caribou habitat and carrying into caribou habitat. Under that scenario, the patch size of the disturbance may be different than what would have occurred under historic conditions. FW-GDL-WL-02 states that management activities within capable habitat should enhance or facilitate the development of suitable habitat. Timber harvest may cause disturbance to caribou, even if it occurs adjacent to caribou habitat but not within. It may also cause disturbance from the use of the roads associated with the timber harvest. IRAs, FW-STD-WL-02, MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, and MA5-DC-WL-01 create and maintain large, remote security habitats that are likely to have a lower amount of human presence due to the difficulties of access.

Motorized Over-snow Vehicles: There would be no change in roads or trails open to motorized use in the alternatives. The acres available for cross-country motorized use would also not change. There would be a difference in the acreage where roads or trails may be designated for

[1] Prior to 1987, the Forest Service completed approximately 7,100 acres of stand replacing timber harvest within the caribou recovery area. Since 1987, there is been less than 5,400 acres of timber harvest on the IPNF and these treatments were designed to move unsuitable habitat conditions towards suitable habitat.

motorized use. Within the woodland caribou recovery area, Alternative C (142,834 acres) would have the least acreage allowing motorized use, followed by Alternatives B Modified (171,819 acres), D (174,691 acres) and A (209,654 acres). The acreage where road construction (both temporary and permanent) could occur would be greatest under Alternative A (176,809 acres) followed by Alternatives D (163,707 acres), Alternative C (143,364 acres) and B Modified (116,849 acres). No road construction would be allowed in critical habitat under any of the action alternatives.

Alternative A would have most acres available for over-snow motorized use. Under the action alternatives, Guideline FW-GDL-WL-04 in the revised Forest Plan states that disturbance from over-snow vehicles during 12/1-4/30 should be avoided or minimized in areas known to be occupied by caribou. Additionally, winter travel planning is ongoing for the recovery zone due to a court order and protective closure for caribou. That effort, in addition to the FW-GDL-WL-04 in the proposed Forest Plan, would result in lower disturbance in winter in caribou habitat compared to conditions prior to the court order. Alternative C (142,834 acres) would have the least acreage allowing over-snow motorized use, followed by Alternatives B Modified (171,819 acres), D (174,691 acres) and A (218,155 acres).

FW-STD-WL-04 states that no grooming of snowmobile routes in grizzly core habitat would occur in the spring after April 1 of each year. This would reduce the chance that disturbance to caribou could occur in those areas of grizzly bear core habitat.

Cumulative Effects

In general, cumulative effects are assessed for the Forest and adjacent lands. The period considered for this analysis is the anticipated life of the Plan, 10-15 years.

Past activities on NFS lands impacted caribou. Over-snow motorized use, prior to the court-ordered closure, may have caused disturbance to caribou. Past fire suppression may have influenced the current risk of large-scale fire within caribou habitat.

All the action alternatives would contribute towards maintaining or improving caribou habitat. Timber harvest occurring on private, State, or Canadian lands may impact the distribution, amount, and quality of caribou habitat and may impact connectivity within the Recovery Zone.

Habitat loss due to timber harvest has not occurred much on NFS lands, as evidenced by caribou habitat being within historic conditions. However, habitat has been lost on State and Canadian lands. If this continues, or if subdivision occurs on any private lands in Canada or the US, then more habitat may be lost. FW-DC-WL-18 and FW-GDL-WL-15 through 17 address connectivity and would improve conditions for caribou.

Utility corridor construction and mining are all possible future effects that could impact habitat or cause disturbance.

The Idaho State Wildlife Conservation Strategy would improve habitat for a variety of species, and when utilized on non-NFS ownerships should complement habitat improvement/maintenance on NFS lands. Woodland caribou is included, and the strategy Identified concerns that include timber harvest, winter recreation, and predation.

Fuels reduction efforts are possible on all land ownerships, in particular where they are near residences. If these are done in such a way that they restore habitat that has been degraded by fire suppression, then habitat can be improved. If not, then habitat can be lost and connectivity impacted.

Essentially all of the habitat loss on NFS lands in the last two decades has been due to insects, disease, and fire. As the climate changes, coupled with past fire suppression, it would be more likely that a large scale disturbance may occur. Even if the wetter sites where caribou habitat occurs had stand replacing fire naturally, the patch size of future disturbance may be larger due to the increase in fuels. As insects and disease create more fuels in non-caribou habitat, the likelihood that a stand-replacing fire would start in those stands and move into caribou habitat increases. Additionally, if snowfall changes due to climate change, then winter habitat or predation may change for caribou. For example, if snow depths lessen, then it would be easier for predators to access current caribou winter habitat. It may cause caribou to shift habitat use to areas with greater snowfall but lesser quality habitat. Distributional shifts are one way species can respond to climate change (page 90 in USDA 2010). Large, stand-replacing disturbance would be more likely and may be exacerbated as the climate changes. Large-scale disturbances could convert a large area of caribou habitat from forested to open in one event. This would significantly alter the availability of arboreal lichen and potentially change how caribou use the landscape. The exact results are difficult to predict due to all the variables involved. The desired conditions for vegetation (FW-DC-VEG-01 through 03, FW-DC-VEG-05, FW-DC-VEG-11, FW-STD-VEG-01, and FW-GDL-VEG-01 and 02) would maintain caribou habitat at historic conditions levels and resiliency.

Border Patrol activities on the Forest have the potential to cause disturbance through use of roads or trails that are normally closed to motorized use. The exact extent/amount of the impact over the life of the Plan is difficult to predict because many factors could influence the amount and location of Border Patrol activity. Generally speaking, the likelihood of Border Patrol presence increases with decreasing distance from the border.

Recreation is likely to increase on all land ownership types, if for no other reason than human population growth. This would increase human disturbance and cause the portions of NFS lands that have lower human disturbance to become more important for caribou.

A combination of access management on NFS lands and predator population management by the State agencies may have an effect for caribou. If the State tries to actively reduce predator numbers, such as mountain lions and wolves, then the lower mortality risk for caribou may help the population. However, access management on NFS lands may restrict when and where motorized use may occur. That may impact the success of mountain lion hunters and wolf trappers who start their hunt by covering a lot of ground looking for tracks. On the other hand, limiting access to roads would decrease disturbance, as would potential restrictions on where snowmobiling could occur. If roads are allowed to revegetate or are obliterated, that may allow caribou to better utilize the habitat near those old road beds if they no longer are an obvious "linear feature" on the landscape.

Big game hunting continues on both sides of the U.S./Canada border. Encounters with hunters may result in a caribou death due to mistaken identification. Legal harvest of caribou by Treaty Indians does occur, but with few statistics on the number of animals taken it is difficult to evaluate the significance of this factor. Fatal collisions with automobiles occur on open roads in woodland caribou habitat (Scott and Servheen 1985) and are likely to continue. Predation by mountain lions, wolves and others predators will continue, depending in part on big game populations, predator populations and other factors. Even a relatively small increase in predation rate, perhaps coupled with increased losses to illegal hunting, can lead to population declines over the long term. FW-STD-WL-02 states that the Access Amendment for grizzly bear would be applied, and this can benefit caribou as well. A reduction in motorized access would reduce the odds of a chance encounter between hunters and caribou.

An adequate amount of suitable habitat is a key factor in maintaining viable caribou populations. Human use of caribou range can result in loss, fragmentation or alteration of important habitat elements, such as winter ranges, calving area or migration routes. In Canada, the main human activities that have and will continue to impact caribou range are timber harvesting, oil and gas exploration and development, coal mining and the proliferation of access that comes from all these industries. In the north, peat land development to harvest peat moss has the potential to impact important caribou habitat.

Decisions made by private and state land holders regarding management of motorized roads and trails on their lands could potentially result in impacts to caribou. Timber harvest occurring on private or State lands may impact the distribution, amount, and quality of caribou habitat and may impact connectivity between NFS lands. The recovery area includes approximately 67,000 acres of private and State lands. Activities here may cause avoidance of these areas.

One important factor is how or if Canadian officials decide to manage this herd. In B.C. portion of the recovery area, the main human activities that have and will continue to impact caribou range are maintenance of gas, powerline, and the international border corridors (i.e., vegetation removal), recreation activities (e.g. snowmobiling, backcountry skiing), limited timber harvest, and maintenance of a major provincial highway (B.C. Highway 3) which includes avalanche control, salting, and jersey barriers along several miles of key woodland caribou habitat. Caribou appear to have habituated to the motorized activity based on their continued observation along this transportation corridor. However, with the majority of the existing herd using habitats north of this highway, movement of appreciable numbers of caribou southward into the United States may be reduced due to short term displacement or death while attempting to cross this highway.

Effects Determination

Each of the action alternatives, may affect, and is likely to adversely affect the woodland caribou and designated woodland caribou critical habitat.

Rationale for Determination: In spite of a reduction in most allowable activities from current management direction, timber harvest and fire management activities, motorized access, road construction and reconstruction, and the low potential for mining, activities under the action alternatives—particularly in the General Forest MA—have the potential to adversely affect individual woodland caribou and their habitat via increased human disturbance and displacement and habitat alteration. Likewise, the increase but judicious use of natural ignitions across the landscape has the potential to adversely affect individual caribou and their habitat via displacement, disturbance and habitat loss. The management of natural ignitions is the one activity that has the greatest potential impact on designated caribou critical habitat on the IPNF. At the project level, all activities would be subject to existing plan components such as standards and guidelines designed to avoid or minimize adverse effects to individual woodland caribou and the habitats they occupy on Federal lands. Given that we cannot predict exact locations of future projects nor are there restrictions on the distribution of effects spatially or temporally, we cannot discount the potential for adverse effects to the Selkirk woodland caribou or caribou critical habitat.

North American Wolverine – Gulo gulo luscus

Affected Environment

The wolverine is one of several species of carnivores that occur on the Forest. Carnivores are important indicators of ecosystem integrity in that they influence the structure and reflect the vigor of the trophic levels upon which they depend. Several carnivores in the western United States have declined dramatically in the last century and a half and are listed as threatened or endangered species (e.g., grizzly bear, Canada lynx), proposed as threatened (wolverine), or are considered sensitive by land management agencies (Noss et al. 1996, cited in Witmer et al. 1998). These species are mostly far ranging, elusive, shy and inconspicuous, occur in low densities, and are active mainly at night (Kucera and Zielinski 1995). Many of these species tend to be wilderness-oriented and have large spatial requirements.

The current knowledge of wolverine population biology, ecology, and habitat descriptions are described in (USDI Fish and Wildlife Service 2013a, Copeland et al. 2010, Copeland et al. 2007, Copeland 1996, Inman et al. 2012 and 2012b, Ruggiero et al. 1994, Thomas 1995, USDI Fish and Wildlife Service 2003b, IDFG 2005) and incorporated by reference. Additional information is provided by the Montana Natural Heritage Program, the Idaho Data Conservation Center and NatureServe databases.

Information on population numbers, trends, and distribution are based on reported observations/sightings of either the species or tracks recorded in forest or state databases. No research has been conducted for wolverine on the Forest that would estimate population levels. Informal surveys are periodically conducted by Forest personnel during snotel measurements, or during aerial flights conducted by the Forest and/or other agencies. Studies or research on wolverine has occurred in the adjacent Flathead NF (Hornocker and Hash 1981) and Glacier National Park (Squires et al. 2007) and in Canada (COSEWIC 2003), just north of the Forests.

In general, the Forest was used for the analysis boundaries, although in some cases activities occurring on adjacent areas were also evaluated (i.e., cumulative effects to connectivity). Areas with persistent spring snow were the primary focus of the analysis because of the importance of these areas as wolverine habitat. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years.

Habitat and Life History Needs

Wolverines generally select areas that are cold and have persistent spring snow, but they do not select for any specific vegetation/habitat type (USDI Fish and Wildlife Service 2013a page 7867).

Wolverines occupy a variety of habitats, but require large tracts of land to accommodate large home ranges and extensive movements (IDFG 2005, Banci 1994). Individual animals have large territories and can cover large distances in short time periods. In Montana and northern Idaho, home ranges have been documented as large as 384 square kilometers for males, although female ranges tend to be smaller. They use several habitats and have been located in forested drainage bottoms to high-elevation, sparsely timbered cirque basins.

Due to their large home range size and habitat needs, this species is rare and uncommon and most likely always has been. Wolverines use higher elevation, steep, remote habitat. Wilderness and roadless lands account for much of the areas wolverines are known to use, although it is unknown if this is due to avoidance of people, or that wolverine tend to choose areas that are not conducive to human development (Copeland et al. 2007). Wolverines appear capable of adjusting to human disturbance (USDI Fish and Wildlife Service 2013a, page 7880)

The primary habitat during the winter is mid-elevation conifer forest, and summer habitat is subalpine areas associated with high-elevation cirques (IDFG 2005). Summer use of high elevation habitats is related to the availability of prey and den sites. Forest types used by wolverines in northwest Montana include subalpine fir, Douglas-fir, lodgepole pine, and Douglas-fir/western larch. More than 70 percent of summer locations and more than 50 percent of fall locations occurred in the subalpine fir forest types (Hornocker and Hash, 1981). High elevation habitats are used for relief from heat and denning (Copeland et al. 2007). Wolverines were more frequently found in low to moderately stocked stands of mature timber.

Inman et al. (2012) described wolverine habitat as “steep terrain with a mix of tree cover, alpine meadow, boulders, and avalanche chutes” (page 785 in Inman et al. 2012). They also state that wolverines experience a trade-off “…between resource acquisition on one hand and avoidance of predation and competition on the other. Wolverines balance these competing interests by exploiting an unproductive niche where predation and interspecific competition are reduced,” (page 785 in Inman et al. 2012).

Females give birth to two-three young in late winter to early spring. Young are born in dens dug through the snow to ground level. Dens are located in the upper subalpine zone, at or near treeline and are associated with boulder fields, avalanche debris, or log jams. A source of carrion or other food is usually nearby.

Wolverines appear to be highly selective in choice of natal denning and kit rearing habitat. Denning habitat may be a factor limiting distribution and abundance (Copeland 1996), and the persistence of snowpack into late spring is a strong determining factor in wolverine presence due to its importance in denning (Copeland et al. 2010, USDI Fish and Wildlife Service 2013a). Persistent spring snow cover may also be a determining factor in wolverine dispersal and has consequences on gene flow (Schwartz et al. 2009)

The wildlife specialist’s report in the project record contains a map that depicts those areas of the IPNF that tend to have persistent spring snow cover. The map shows areas with persistent snow as considered by Copeland et al. (2010). That map highlights the areas with persistent spring snow in an average of at least 6 out of 7 years. In other words, those were the areas to most likely have persistent spring snow and the most likely places for wolverine dens (Copeland et al. 2010, page 239). Among those areas most likely to have wolverines are the Selkirks, West Cabinets, and a few areas along the southern periphery of the Forest.

Inman et al. (2012b) found a link between persistent snow and wolverine foraging strategy. Wolverines appear to rely on the cold and snow to cache carrion. Cold, structured microsites are used to cache food and this reduces competition from insects, bacteria, and other scavengers for this food source. The authors referred to this as the “refrigeration-zone” hypothesis (Inman et al. 2012b).

In the northern Rockies wolverine natal dens have been found under snow-covered tree roots, logjams, and rocks/boulders (Hash 1987). In central Idaho, Copeland (1996) found natal den sites in boulder talus areas with a north aspect within subalpine cirques. No information is available on den sites on the Forest, however, it is expected that they would be similar to surrounding area den sites.

Wolverines are opportunistic feeders and consume a variety of foods depending on availability. They primarily scavenge on carrion, but also prey on small animals and birds, and eat fruits, berries, and insects (Hornocker and Hash 1981 page 1290, Banci 1994, pages 111-113). They are primarily scavengers and feed upon carrion or ungulates killed by large predators, such as wolves, bears, cougars, and humans or animals that have died from natural causes. They occasionally kill their own prey when the opportunity arises, typically small mammals. The constant search for food keeps them moving throughout their range; daily movements of 20 miles are common. Hornocker and Hash (1981) suggested that food availability is the main factor determining movements and range of wolverines in the South Fork drainage.

Connectivity between wolverine populations and habitat patches is generally tied to persistent spring snow, and wolverines appear to currently be able to disperse between habitats and through areas where human developments occur (Schwartz et al. 2009, USDI 2013 page 7879). As concluded in USDI Fish and Wildlife Service (2013a on page 7879), “The available evidence indicates that dispersing wolverines can successfully cross transportation corridors.”

Key Stressors Affecting Wolverine

The stressors may cause loss of habitat, loss of connectivity, displacement, or mortality.

Stressors Outside Forest Service Control

- Loss and fragmentation of habitat may isolate populations, reduce genetic diversity, and increase the risk of population extirpation (Copeland and Whitman 2004 cited in IDFG 2005). These risks result from three main factors: 1) small total population size; 2) effective population size below that needed to maintain genetic diversity and demographic stability; and 3) the fragmented nature of wolverine habitat in the contiguous United States that results in smaller isolated “island” patches separated by unsuitable habitats. Loss of persistent spring snow related to climate change is the main factor in loss/fragmentation of wolverine habitat (USDI Fish and Wildlife Service 2013a page 7865); and
- Harvest is considered the factor affecting wolverine survival, with trapping accounting for the greatest number of individuals (Hornocker and Hash 1981, Banci 1994, Krebs et al. 2004, Squires et al. 2007). Although harvest of wolverines is illegal in Idaho, incidental trapping may contribute to mortality in that state. The state of Montana, in its most recent regulations for fur trapping, identified wolverine management units with the KNF in WMU 4, the central insular mountains. The trapping quota for this WMU is zero wolverine. In order to achieve dispersal and gene flow among the areas identified as core (NCDE, Salmon Selway, and Yellowstone ecosystems) for wolverine, wolverines are protected in WMU 4. This protection could result in higher adult female survival, which is influential in population growth rate, but could also result in higher survival of young dispersing wolverines as they move through the various mountain ranges. Overall, the statewide quota is 3-5 wolverines. However, the USFWS proposed listing the wolverine as threatened in February of 2013, so the continuation of the trapping season in Idaho is uncertain.

There are no Forest Service management activities that threaten wolverines (direct effects) or high-elevation habitats (indirect effects). Activities on NFS lands do not pose a threat to the viability of the species. Activities that are not likely to disturb wolverines, or habitat, and therefore threaten the viability of the species include (USDI Fish and Wildlife Service 2013a pages 7890 and 7877-7880):

- Dispersed recreation such as snowmobiling, skiing, backpacking, and hunting for other species;

- Management activities such as timber harvest, wildland firefighting, prescribed fire, and silviculture; and
- Mining.

Wolverines have been documented to persist and reproduce in areas with high levels of human use and disturbance (USDI Fish and Wildlife Service 2013a page 7877). There appears to be no evidence that the activities listed above (e.g., snowmobiling, skiing, timber harvest, and mining) translate to threats to subpopulations, populations, vital rates, gene flow, and population persistence (USDI Fish and Wildlife Service 2013a page 7877). USDI Fish and Wildlife Service (2013a) cited ongoing research into the impacts of high levels of recreational use on wolverines in central Idaho. The ongoing research has documented wolverines living in areas of high recreational use (i.e., disturbance) (USDI 2013 page 7878, Heinemeyer 2012, Heinemeyer and Squires 2012).

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

There are no stressors under Forest Service control that would impact wolverine populations.

There is no direction in the action alternatives that will impact wolverine populations. Wolverines are not tied to a specific vegetation type, Forest activities would not change the amount of persistent spring snow, and the types of activities allowed on the Forest fit under the list on page 7890 of USDI Fish and Wildlife Service (2013a). The action alternatives will not impact the extent of persistent spring snow, or the impact of trapping mortalities. Those are the two factors identified as most likely to impact wolverine populations (Ibid).

Cumulative Effects

In general, cumulative effects are assessed for the Forest and adjacent lands. Areas with persistent spring snow were the primary focus of the analysis because of the importance of these areas as wolverine habitat. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, for some effects, a longer timeframe was considered (e.g., climate change).

Climate change may alter temperature and precipitation, which in turn may affect the persistence of spring snow cover. Cold adapted species such as wolverines are the most likely to be impacted by warming climates (page 91 in USDA Forest Service 2010). If the area with snow cover into late spring diminishes, then the amount of habitat available for wolverines would diminish. As habitat diminishes, wolverine reproduction may decline (i.e., lack of suitable denning habitat) and populations may become isolated (USDI 2013 page 7880).

Trapping, which includes illegal, incidental, and legal, can limit population growth or contribute to a decline. Trapping for wolverines is not allowed in Idaho but it was in Montana, although it is currently not allowed in the management unit that overlaps the KNF. The continuation of trapping in Montana is in question due to the proposed listing of wolverine as threatened (USDI 2013).

Effects Determination

None of the action alternatives is likely to jeopardize the continued existence of the wolverine.

This determination is based in part on:

- There is no direction in the action alternatives that will impact wolverine populations. Wolverines are not tied to a specific vegetation type, Forest activities would not change the amount of persistent spring snow, and the types of activities allowed on the Forest fit under the list on page 7890 of USDI (2013a). The action alternatives will not impact the extent of persistent spring snow, or the impact of trapping mortalities. Those are the two factors identified in USDI (2013a) as most likely to impact wolverine populations.

Sensitive Species

The sensitive species analysis in this document and the wildlife specialist’s report in the project record meet the requirements for a biological evaluation as outlined in FSM 2672.42.

Sensitive species are administratively designated by the regional forester (FSM 2670.5) and managed under the authority of the National Forest Management Act. FSM 2670.22 requires the maintenance of viable populations of native and desired non-native species and to avoid actions that may cause a species to become threatened or endangered.

The National Forest Management Act (36 CFR 219.19) directs the Forest Service to manage habitat to maintain viable populations of existing native and desired non-native vertebrate species. A viable population is defined as one that has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area, the IPNF.

Region 1 updated the sensitive species list in 2011.

American Peregrine Falcon - Falco peregrinus anatum

Affected Environment

Peregrine falcon population biology, ecology, habitat description and relationships identified by research are described in USDI Fish and Wildlife Service (1999, 2003) and incorporated by reference. Additional information on the species is included in Montana Fish, Wildlife, and Parks (2005, 2007), the Montana Natural Heritage Program (MNHP and MFWP 2011) and NatureServe (2011)

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. Consideration was given to any effects that may last beyond the life of the Plan (e.g., vegetation changes).

Habitat and Life History Needs

The peregrine falcon inhabits a wide range of habitats from Arctic tundra, sea coasts, and prairies to urban centers. Most falcons nest on cliff ledges or crevices, but some will also use tall buildings and bridges near good foraging areas. Nests are scraped in substrate on cliff ledges. Adult falcons demonstrate a high degree of breeding fidelity and are known to reuse the same nest site for several decades (USDI Fish and Wildlife Service 2003c). Peregrine falcons feed primarily on birds (medium size passerines up to small waterfowl). They have occasionally been reported to prey on small mammals (e.g., bats, lemmings), lizards, fishes, or insects (by young birds). Prey is pursued from a perch or while soaring (MTNHP 2007).

On the Forest, cliffs or rock substrates suitable for nesting are found along the main river corridors and adjacent valley bottoms, including the Kootenai, Clark Fork, etc., which are used as feeding sites. However, according to biologists with the Peregrine Fund (Sumner and Rogers 2006), quality potential nesting sites consisting of sheer vertical cliffs adjacent to feeding habitat are rare on the IPNF. Natural nesting habitat has not changed significantly since populations crashed and is still largely available.

Key Stressors

Activities on NFS lands within peregrine falcon nest territories have the potential to impact falcons during the nesting period, depending on the type of activity and the distance of the activity from an active nest site. Falcon nests are generally constructed in areas where human activities do not occur; however, activities within ½ mile of an active nest site have the potential to impact falcons (Hamann et al. 1999). Disturbance can displace individuals and cause nest abandonment. Nesting and fledging activity is generally between February 1 and August 31.

Forest Service activities that may have direct or indirect impacts on the peregrine falcon include timber harvest, road construction, quarry development, prescribed fire, fire suppression, and human activities that could alter habitat or disturb nesting birds. Nest failure can occur due to human disturbance such as recreational climbing (USDI 1999), or industrial activities, such as helicopter use or blasting. Habitat altering activities can remove nesting habitat or diminish the suitability of that habitat. Activities that alter habitat for prey species (e.g., migratory birds) can also impact peregrine habitat use and may lead to displacement.

Factors beyond Forest Service control include (cumulative effects): pesticide use, persecution, collection of young for falconry, mortality from illegal shooting and collision with wires, fences, cars, buildings, and threats during migration and on their wintering grounds. A potential new threat that may impact falcon populations includes chemicals commonly used in fire retardants (memo associated with the American Association for the Advancement of Science 2004). These chemicals have been found in peregrine falcon eggs; however, the effect of these compounds on eggs is unknown and is being studied in the peregrines North American range (memo associated with the American Association for the Advancement of Science 2004).

Environmental Consequences – American Peregrine Falcon

Effects Related to Key Stressors under Forest Service Control

Disturbance: Under current management, sensitive species habitat is managed based on the best available information. Disturbance associated with motorized use would be limited by the topography where peregrine falcons like to nest. Cliffs can be found near roadways, but peregrine falcons have proven to be somewhat tolerant of traffic related noises because they can be found nesting in other parts of their range on buildings or bridges. Recreationists near nest sites may cause greater disturbance. In particular, rock climbing in the vicinity of a nest may cause nest failure. Disturbance from a variety of activities on NFS lands can cause peregrines to be displaced or abandon nests. FW-DC-WL-01, FW-DC-WL-08, and FW-GDL-WL-20 will limit disturbance around peregrine nests and will decrease the likelihood of displacement or nest abandonment. In particular, FW-GDL-WL-20 provides direction to place a timing restriction and distance buffer around known active nests where management activities should avoid or minimize disturbance. Helicopters and other equipment and human presence associated with fire suppression and prescribed burning could also disturb falcons and cause them to avoid the area. Nest failure would be another possibility. Smoke related to fires, natural, prescribed, or other human caused may cause falcons to avoid an area. Depending on the duration and intensity, that disturbance may last days or weeks. If that occurs during the time a nest is active, it may cause nest abandonment. Timber harvest will not remove nesting habitat, although activities near a nest may cause disturbance, particularly if the logging operation includes helicopters. Options include timing restrictions and specifying a distance from the nest within which helicopter flights could not occur.

Habitat Alteration: Under current management, sensitive species habitat is managed based on the best available information. Given the inaccessible nature of peregrine nests, they are unlikely to be directly removed by management activities. However, management activities that impact prey species habitat can displace peregrines. FW-DC-VEG-01 through 08, FW-DC-VEG-10 and 11, FW-STD-VEG-01 and 02, FW-GDL-VEG-01 through 06, FW-DC-FIRE-03, FW-DC-WL-08, FW-DC-WL-10 through 15, FW-GDL-WL-08, and much of the direction found in the “Watershed, Soil, Riparian, and Aquatic Resources” section will maintain or improve habitat for peregrine prey species. Primarily this will be improved or maintained habitat for migratory birds. Implementation of FW-DC-FIRE-03 will allow fire to play a more natural role in the ecosystem, and the vegetation will be managed for historic conditions and improved resiliency to large-scale disturbance processes. Migratory bird species will react differently to this with some species declining and some increasing. The quantity and arrangement of habitats will be nearer to what these species will have evolved within these ecosystems. Peregrines, also having evolved in these ecosystems under those conditions, may shift prey preference to more abundant species. Canopies will be more open, which may aid in peregrines being able to spot prey. Large scale fires will also be less likely, so smoke that would cause falcons to abandon a nest will be shorter in duration.

Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), and D (7,912 acres/year under constrained budgets. Alternative A will treat 10,867 acres/year. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year) and D (10,790 acres/year). Alternative A will treat 11,537 acres/year. Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives, with 6,000 acres/year in Alternative A.

Alternative A (current Forest Plan as implemented) will be more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire for habitat restoration/maintenance. The use of natural, unplanned ignitions (passive restoration) will be more likely in MA1, and Alternative C (335,300 acres) will have the most MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and A (153,900 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

Cumulative Effects

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. Consideration was given to any effects that may last beyond the life of the Plan (e.g., vegetation changes).

Past activities on NFS lands probably did not have a great impact on peregrine falcons on the Forest. Recreational activities are the most likely candidate to have caused direct disturbance to peregrines. Indirectly, past timber harvest, fuels reduction, and fire suppression may have altered migratory bird habitat on the Forest and therefore prey distribution/availability for peregrine falcons. Water impoundments on all ownerships may have created waterfowl habitat and therefore increased prey availability in some locations.

The effects of climate change on potential prey of peregrine falcons is likely greater than the direct effects for this species. As vegetation habitat changes in relation to climate change, then the bird populations and species distribution may change (page 90 in USDA Forest Service 2010). This may mean peregrine falcon prey preference would shift to species that become more abundant as the climate changes. FW-DC-VEG-01 through 08, FW-DC-VEG-10 and 11, FW-STD-VEG-01 and 02, FW-GDL-VEG-01 through 06, FW-DC-FIRE-03, FW-DC-WL-08, FW-DC-WL-10 through 15, FW-GDL-WL-08, and much of the direction found in the “Watershed, Soil, Riparian, and Aquatic Resources” section will maintain or improve habitat for peregrine prey species. Primarily this would be improved or maintained habitat for migratory birds. Implementation of FW-DC-FIRE-03 will allow fire to play a more natural role in the ecosystem, and the vegetation will be managed for historic conditions and improved resiliency to large-scale disturbance processes.

Recreation is likely to increase on all land ownership types, if for no other reason than human population growth. This would increase human disturbance and potentially impact nesting habitat on all ownerships.

Due to restrictions on pesticides, mortality on peregrine falcons has decreased.

Persecution, collection of young for falconry, mortality from illegal shooting and collision with wires, fences, cars, buildings, and threats during migration and on their wintering grounds also impact peregrine populations. Chemicals from fire retardant have been found in peregrine eggs but the effects are still being studied (memo associated with the American Association for the Advancement of Science 2004).

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for peregrine falcon. This determination is based in part on:

- FW-DC-WL-01, FW-DC-WL-08, and FW-GDL-WL-20 will limit disturbance around peregrine nests and will decrease the likelihood of displacement or nest abandonment. In particular, FW-GDL-WL-20 provides direction to place a timing restriction and a distance buffer around known active nests where management activities should avoid or minimize disturbance; and
- Given the inaccessible nature of peregrine nests, they are unlikely to be directly removed by management activities. However, management activities that impact prey species habitat can impact peregrines. FW-DC-VEG-01 through 08, FW-DC-VEG-10 and 11, FW-STD-VEG-01 and 02, FW-GDL-VEG-01 through 06, FW-DC-FIRE-03, FW-DC-WL-08, FW-DC-WL-10 through 15, FW-GDL-WL-08, and much of the direction found in the “Watershed, Soil, Riparian, and Aquatic Resources” section will maintain or improve habitat for peregrine prey species. Primarily this will be improved or maintained habitat for migratory birds.

Bald Eagle – Haliaeetus leucocephalus

Affected Environment

Bald eagle population biology, ecology, habitat description and relationships identified by research are described in USDI Fish and Wildlife Service (1986, 2007b), and the Birds of North America Online (Buehler 2000) and incorporated by reference. Additional information is included in the Montana Natural Heritage Program (MNHP and MFWP 2011); and NatureServe databases (2011) and in the National Bald Eagle Management Guidelines (USDI Fish and Wildlife Service 2007b).

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Habitat and Life History Needs

In Idaho, as elsewhere, the bald eagle is primarily a species of riparian and lacustrine habitats (forested areas along rivers and lakes), especially during the breeding season. Important year-round habitat includes: wetlands, major water bodies, spring spawning streams, ungulate winter ranges, and open water areas (MBEWG 1994).

Habitat for bald eagles on the Forest not only involves existing breeding areas (nest territories), but also suitable nesting habitat, and wintering and migration habitat as well. Nesting sites (both current nesting and suitable habitats) are generally located within larger forested areas near large lakes and rivers where nests are usually built in the tallest, oldest, large-diameter trees, primarily along the Kootenai, Clark Fork, and Pend Oreille River corridors and associated lakes and reservoirs. Nesting site selection is dependent upon maximum local food availability and minimum disturbance from human activity (Montana Bald Eagle Working Group 1994). The majority of their diet is comprised of fish. Important prey for bald eagles includes; waterfowl, especially in the winter, salmonids, suckers, whitefish, carrion, and small mammals and birds (MNHP and MFWP 2011).

Nearly all current nests on the Forest are located within one-quarter mile of, and overlook an adjacent water body. The Forest, in concurrence with the FWS, has mapped potential nesting habitat along all major river corridors and has maintained mature trees within those areas for current and future use by bald eagles. Suitable unused nesting habitat for bald eagles remains available throughout portions of the Forest and it is likely they will continue to expand. Both resident and seasonal winter use also occurs on the Forest.

Key Stressors Affecting the Species (Risks and Threats) – Indirect Effects

Activities on NFS lands within bald eagle nest territories have the potential to impact eagles during the nesting period, depending on the type of activity and the distance of the activity from an active nest site. Although eagles construct and use nests in areas with ongoing activity, it is generally activities beyond those under which nests were constructed which have the potential to displace eagles. Based on Forest monitoring, the period in which activities have the greatest influence on nesting and rearing activities generally occurs between February 1 and July 15. Forest Service activities that may have direct or indirect impacts on bald eagles include timber harvest, road construction, prescribed fire, and fire suppression that could alter habitat or disturb nesting birds. Nest failure can also occur due to human disturbance from recreation or industrial activities, such as helicopter use or blasting.

Human activities near or within communal roost sites may prevent eagles from feeding or taking shelter, especially if there are no other undisturbed and productive feeding and roosting sites available (USDI Fish and Wildlife Service 2007b). Activities that permanently alter communal roost sites and important foraging areas can altogether eliminate the elements that are essential for feeding and sheltering eagles (Ibid).

Stressors outside Forest Service control (cumulative effects) include pesticide use, persecution, private development of lands in nesting or foraging habitat, mortality related to other factors such as powerlines and collisions with vehicles, and the possible take of bald eagles allowed under the USFWS 2007 rule.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Nesting: As a sensitive species, nests are currently protected from destruction and disturbance. The National Bald Eagle Management Guidelines (2007b) also apply to current management. Management activities that could impact nesting habitat include prescribed fire, timber harvest, roads, and others. FW-GDL-WL-05 places timing restrictions and distance buffers around bald eagle nests that will reduce the chance of disturbance that would displace eagles or cause nest abandonment. FW-DC-WL-01, GDL-WL-06 and 07 will protect nest trees and maintain nest site habitat suitability. Other direction that will improve or maintain stand conditions and therefore nesting habitat includes: FW-DC-VEG-01 through 07, FW-DC-VEG-11, FW-DC-FIRE-03, FW-DC-WL-06, FW-DC-WL-12 and 13, and much of the "Watershed, Soils, Riparian, and Aquatic Resources" section of the revised Forest Plan.

Roosting/Foraging: Under current management, roost and foraging areas are protected through the National Bald Eagle Management Guidelines (2007). Management activities can remove roosting habitat or cause disturbance that displaces bald eagles. FW-GDL-WL-05 places timing restrictions and distance buffers around bald eagle roosts that will reduce the chance of disturbance that would displace eagles. FW-GDL-WL-05 and 06 protects roost sites and reduces the chance of disturbance as well. Big game is a source of carrion in winter. Big game habitat will be maintained or improved through FW-DC-VEG-01 through 05, FW-DC-VEG-10 and 11, FW-DC-FIRE-03, FW-DC-WL-17, FW-GDL-WL-11 through 14, GA-DC-WL-CDA-02, and GA-DC-WL-SJ-01.

Cumulative Effects

Please see the "Cumulative Effects Common to Most Species" section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the "Cumulative Effects Common to Most Species" section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past timber harvest, fuels reduction, and fire suppression has altered the pattern and availability of ungulate habitat, which in turn impacts the availability of carcasses for bald eagles to feed on. Recreational activities on NFS lands are the most likely to have had direct impacts on bald eagles on the Forest. Water impoundments on all ownerships have potentially altered the availability of prey (e.g., fish and waterfowl).

Climate change could impact bald eagles. It could change the duration and average temperature in winter. That could change how long ice lasts on some waterbodies. Therefore, access to water for foraging may change (i.e., a shift in seasonally available food sources, page 90 in USDA Forest Service 2010). On the other hand, less severe winters in terms of cold and snow may lead to better survival for ungulates. That would reduce the number of carcasses available for eagles.

Big game habitat will be maintained or improved through FW-DC-VEG-01 through 05, FW-DC-VEG-10 and 11, FW-DC-FIRE-03, FW-DC-WL-17, FW-GDL-WL-11 through 14, GA-DC-WL-CDA-02, and GA-DC-WL-SJ-01. Direction that will improve the resiliency of nest stands to climate change includes FW-DC-VEG-01 through 07, FW-DC-VEG-11, FW-DC-FIRE-03, FW-DC-WL-06, FW-DC-WL-12 and 13, and much of the Watershed, Soils, Riparian, and Aquatic resources section of the revised Plan.

Due to restrictions on pesticides, and reduced poaching, mortality on eagles has decreased.

Persecution, private development of lands in nesting or foraging habitat, mortality related to other factors such as powerlines and collisions with vehicles, and the possible take of bald eagles allowed under the USFWS 2007 rule can all impact bald eagles.

The action alternatives will contribute towards improving nesting, roosting, and foraging habitat for bald eagles. This is due to returning conditions nearer to historic conditions, facilitating the development of large trees, and restoring habitat to a more sustainable and resilient condition for ungulates.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for bald eagle. This determination is based in part on:

- FW-GDL-WL-05 set timing restrictions and distance buffers around nests and roosts in order to reduce effects from disturbance;
- Additional plan direction that will protect or maintain bald eagle habitat, or food availability, include: FW-DC-WL-01, FW-DC-WL-06, FW-DC-WL-12, FW-DC-WL-13, FW-GDL-WL-05 through 07, FW-GDL-WL-11 through 14; and
- Additionally, much of the direction in the “Watershed, Soils, Riparian, and Aquatic Resources” section of the revised Forest Plan will maintain or improve the aquatic resources that bald eagles rely upon.

Bats – (Myotis thysanodes) and Townsend’s Big-eared Bat – (Corynorhinus townsendii)

Affected Environment

This group includes the fringed myotis (*Myotis thysanodes*) and Townsend's big-eared bat (*Corynorhinus townsendii*).

Bats are an important component to the health of ecosystems and their role as the main predators of nocturnal insects, especially agricultural and forest pests, also contribute economic benefits. From an ecological perspective, bats regulate nocturnal insect populations which are inherently vital to nutrient cycling. As a group, bat numbers are poorly understood and there are few quantitative data with which to determine their population status and trends. Information on distribution, habitat requirements, migration routes, hibernation areas, and population trends is lacking for most bat species (Lenard et al. 2009). The current knowledge of their life histories, habitat requirements, distribution, ecology, and status of this group varies (Miller et al. 2005, IDFG 2005, and MFWP 2005). Additional investigative work has been done by the Northern Region of the Forest Service in cooperation with the state agencies in Idaho and Montana. More detailed information on specific species is located in the various references cited.

Information on source habitats and special habitat features are described in Wisdom et al. (2000). Management for bats is tiered to the Townsends Big-Eared bat species conservation assessment and conservation strategy (Pierson et al. 1999), and the Idaho Bat Conservation Plan (Miller et al. 2005). Additional information and management direction is found in various databases such as Bat Conservation International.

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Habitat and Life History Needs

Surveys (Hendricks and Maxell 2005) conducted on the IPNF identified that bats were detected in most habitat types, from early seral "disturbance" sites in recent clearcuts and burns to mature and late-successional stands, in ponderosa pine and riparian sites at low elevation to Engelmann spruce and subalpine fir at moderate elevation. Riparian, "disturbed," and late-successional/mature sites accounted for over 72 percent of the 188 sites sampled with bat detectors (Hendricks et al. 1996). However, bat activity occurred significantly more frequently in late-successional/mature forest (71.4 percent) than in "disturbed" forest stands (46.7 percent of sites). This is similar to other studies in western America (Hendricks et al. 1996). Late-successional and mature forests, which have a more complex structure often show greater bat activity than younger or disturbed forest stands (Perkins and Cross 1988, Thomas 1988, Thomas and West 1991).The availability of large snags, a component infrequently found in young and disturbed stands, is recognized as one of the most important attributes of late-successional and mature forests for bats in western North America (Hendricks et al. 1996), as large snags provide important roost sites.

In Idaho, fringed myotis have been encountered most frequently at low- and mid-elevation mines. Dominant vegetation at capture sites has included sagebrush, mountain mahogany, and ponderosa pine. The species has often been encountered in steep river valleys, large canyons, or other sites having steep and rocky terrain. No information is available to indicate what habitats or roost sites are used as maternity sites or hibernacula. This species is likely a short distance migrant to hibernacula; elsewhere hibernacula have been found only in buildings and mines (e.g., O'Farrell and Studier 1980 in IDFG 2005).

Fringed myotis roost sites include tall snags (>21 in dbh) in the early stages of decay and multiple roosts within a stand (Weller and Zabel 2001 in Schwab and Dubois 2006). This species can also roost in caves, mines, rock crevices, bridges, and buildings (Genter and Jurist 1995 in Schwab and Dubois 2006). Hibernacula have primarily been documented in abandoned mines.

The lack of association of Townsend's big-eared bat to any forest type during Montana surveys is consistent with its known habits of roosting in buildings, bridges, caves and mines (Christy and West 1993, Wunder and Carey 1996). Townsend's big-eared bats are considered forest generalists within the subalpine, montane, upland woodland, and riparian woodland community groups (Wisdom et al. 2000). Bats appeared in equal proportions of late successional/mature and riparian sites. This is not considered surprising as bats need water and insect activity is often high at water sources (Christy and West 1993).

Caves and abandoned mines are the primary roost sites for Townsend's big-eared bat throughout most of its range though buildings have been used by maternity colonies in the northern cooler portions of the range. Bridges can be used as night roosts. Solitary males can often be found in smaller caves, mines, root cellars, buildings and hollow trees that are unsuitable as maternity roosts (Schwab and Dubois 2006).

The term roost is used to describe any place a bat may use to rest, digest, socialize, mate, give birth, or sleep. Bats may use a wide variety of roosts for different purposes. During the day, bats sleep or enter a semi torpid state in a day roost. Some bats use a night roost to rest and digest evening and night meals. Day and night roosts are usually separate locations. Pregnant females congregate in maternity roosts to give birth and raise their young. Males and non-reproductive females gather in separate locations called bachelor colonies. Bats that do not migrate in winter hibernate in hibernacula.

Different purposes require different characteristics for each kind of roost. Bats select roosts that protect them from predation and disturbance. Environmental considerations also determine the qualities of a roost. Day roosts must block sunlight. Maternity roosts must be warm and near foraging areas. Warm temperature is important for maternity colonies because it speeds up fetal and juvenile development. Hibernating bats choose roost sites with cold stable temperatures to conserve energy, and humid climates to prevent dehydration during hibernation. The least known types of roosts are those used during migration. These roosts may be used for a limited time each year. Just as wetlands provide important stop over areas for migrating waterfowl migration roosts may provide important habitat for maintaining populations of migrating bats.

Bats forage upon arthropods, mainly nocturnal flying insects, although the mode of prey capture is highly variable. A wide variety of insects are taken including moths, beetles, flies, bees and wasps, and true bugs.

Habitat Estimates

There are very few natural caves on the Forests. Abandoned/inactive mines are scattered throughout the Forests. Not all of these sites are suitable for roosting activities, but the possibility exists that some of them do and may currently provide habitat for bats. Rock/talus slopes are present throughout the Forest especially along the river and stream systems on the Forest and many of the larger lake and wetland areas. Use of snags, bridges, buildings, and rock crevices are available throughout the Forest and provide habitat for roosting and foraging. Bat maternity roosts and hibernacula have been documented in Idaho and on the IPNF, although they are rare.

The current extent of habitat is similar to historical distribution, although the abundance of habitat has changed in some areas. The number of caves likely has stayed the same from historical to present periods, but human disturbance from recreation has increased, thereby causing some caves to be abandoned by bats (Idaho conservation effort 1995 in Wisdom et al. 2000). Mines proliferated in the early part of the historical period and provided additional habitat but during the 1980s thousands of abandoned mines throughout the west were closed resulting in unknown loss of established roosts (Ibid). The extent of cliffs and rocky areas has not changed since the historical period, but habitat quality of some cliffs has declined because of human disturbances (Lehmkuhl et al. 1997 cited in Wisdom et al. 2000).

Large Size Class/Late-Successional Forest

Wisdom et al. (2000) identified that there has been a strong decline in source habitats throughout the Interior Columbia Basin for species dependent on late-successional forest habitats present over broad elevations. However, late-successional forests are still considered to be well distributed across the Forest. In addition to current late-successional, the Forest is managing additional lands for their late-successional characteristics, such as large trees. The current trend is such that late-successional forests are no longer targeted for timber harvest and there is an increase in the number of large diameter trees retained in areas of vegetation management. Over the short- and long-term natural vegetation succession will result in an increase in the amount of lands in the large size class and subsequently in the amount of late-successional forest components, such as snags, important for these species.

Snags

Rabe and others (1998 cited in Wisdom et al. 2000) suggest that snag roosting bats may require higher densities of snags than cavity nesting birds because the stage at which snags are suitable for bat roosts (exfoliating bark) is extremely short-lived, requiring the use of several snags over the course of a lifetime of a bat. Bats frequently shift maternity roosts, possibly to find snags with better thermal conditions when the bark on the previous roost is no longer suitable (Ibid).

A snag analysis recently conducted for the Forest (Bollenbacher et al. 2009) provides an estimate of the number of snags currently existing throughout the forested portion of the Forest. The analysis compared the amount of snags in wilderness/roadless areas versus those outside wilderness/roadless areas. The analysis also identified however, that areas outside of wilderness/roadless areas have fewer snags per acre than those in wilderness/roadless areas. The snag densities within wilderness/roadless areas provide insight into natural snag abundance and distribution, and this can be compared to areas outside of wilderness/roadless (page 4 in Bollenbacher et al. 2009). The 90 pecent confidence intervals for wilderness/roadless area snags overlap with the confidence intervals for areas outside of wilderness/roadless (table 2 in Bollenbacher et al. 2009). In other words, the number of snags outside of wilderness/roadless areas, which represents natural snag abundance, is not very different than the number of snags outside of wilderness/roadless. Please see the snag discussion in the "Vegetation" section of the FEIS and DEIS (pages 65-68 in the DEIS) for more information regarding the findings of Bollenbacher et al. 2009 and the amount of snags available on the Forest.

Key Stressors Affecting Bats

Miller et al. described the main threats to bats in Idaho. All species are vulnerable to habitat loss, and disturbances can cause habitat displacement or abandonment of roosting, hibernation, or maternity sites. This can occur from the removal or degradation of suitable habitat conditions due to timber harvest or fire, or from human disturbance.

The main threats to bats are:

- Disturbance of roosting sites, especially hibernacula and maternity sites;
- Environmental contaminants, including pesticides, heavy metals, and petroleum;
- Habitat degradation;
- Timber harvest;
- Fire;
- Mine closure and reclamation projects that close bat access to mines;
- Destruction of cliff roosts;
- Increased recreation in caves;
- Grazing practices may alter vegetation, which may alter the invertebrate community;

- Wind farms and other large energy developments;
- Water resources;
- Hazards at stock tanks;
- Pollution;
- Lack of information, especially about migration; and
- Intolerance of bats by people.

Stressors to bats that are outside the control of Forest Service management may include (cumulative effects):

- Global warming (climate change): may increase the risk of changes in forest composition due to increased and prolonged summer temperatures and/or drought conditions, and/or the increased risk of fire that may impact forest cover and structure;
- Private land development: developments to support increased human populations that may impact suitable forest cover on non-public lands, and impact roost sites off public lands;
- More recently a disease known as white nose syndrome has been observed in many bats of the eastern US: if WNS continues to spread at its current rate it has the potential to threaten entire species (Frick et al. 2010);
- Wind farms and other large energy developments: some bat species are susceptible to mortality from collisions with wind turbines;
- Water resources:
    - 1. Hazards at stock tanks; and
    - 2. Pollution;
- Lack of information especially about migration; and
- Intolerance of bats by people may result in the purposeful killing of roosting bats.

The following Forest Service management activities may impact bats or their habitat (indirect effects) and cause disturbance, roost abandonment, or mortality:

- Disturbance of roosting sites, especially hibernacula and maternity sites, primarily by recreational activities in or near caves but also from mining, road construction, and any other activities near roosts (Idaho conservation effort 1995 in Wisdom et al. 2000, page 310);
- Environmental contaminants, including pesticides, heavy metals, and petroleum; the use of insecticides in foraging areas has the potential to impact bat species primarily by reducing the prey base;
- Habitat degradation, alterations, and disturbances of any structures used for day roosts, nursery colonies, or hibernacula (caves, mines, old buildings) could affect the persistence of individual colonies (Wisdom et al. 2000);
- Timber harvest directly reduces the availability of roost sites (snags) and indirectly reduces prey populations due to changes in forest composition and structure;
- Fire (both planned ignitions and natural, unplanned ignitions) also reduces roost site availability, but in turn can produce additional roosting sites, or direct mortality; long-term fire suppression may alter the vegetation community, interrupt snag recruitment and increase fire severity;

- Caves and/or abandoned mines and buildings may be removed or closed due to human safety concerns resulting in habitat loss, or those sites used by roosting bats may be vulnerable to human disturbances due to recreational use;
- Destruction of cliff roosts;
- Increased recreation in caves;
- Grazing practices may alter vegetation, which may alter the invertebrate community; and
- Road and right-of-way construction could result in the direct removal of snag or cliff habitat, as well as the additional loss over time of snags along open roads due to fuel wood cutting.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Disturbance/Access: The existing level of disturbance and access to mines/caves will be expected to continue under Alternative A. Access and recreation will have the potential to impact roosting bats or alter habitat. Most firewood cutting occurs in close proximity to open roads, and the loss of snags reduces the amount of potential roosting habitat for bats. Open roads also facilitate increased human presence for recreation and the collection of forest products which can cause disturbance to bats. Recreational caving or exploration of old mines not only disturbs roosting bats and can cause displacement or the expenditure of limited fat reserves, but it can also spread the fungus responsible for white-nose syndrome. If useful for bat protection, FW-GDL-WL-09 allows the installation of bat gates on abandoned mines. FW-GDL-WL-21 provides direction to avoid or minimize disturbance to active roosts or hibernacula, and this guideline can be used to close caves and abandoned mines (distance buffer) to protect bats from management activities. This guideline and FW-DC-WL-01 can be used to reduce disturbance at birthing/rearing areas (certain roosts) from not only recreation but from other activities as well. A letter dated July 28, 2010 from Forest Service Deputy Chief Holtrop implements an Interim Response Strategy that includes applying decontamination protocols at all abandoned mines and caves by 10/1/2010 (Holtrop 2010). This includes public entry/exit. Combined, these measures should reduce the likelihood of white-nose syndrome spreading to the Forest.

Loss of Roosts/Hibernacula: Fires can both create and destroy bat habitat. Fires burn existing snags that may be used for roosting, but they also create new snags. Fires also alter vegetation structure and patterns, which in turn impact bat habitat and prey abundance. Increased fuels retard the development of large trees, and large trees eventually become snags that can be used for roosting. Fires are more likely to be suppressed under Alterative A. Under the action alternatives, fuels reduction treatments that are done to move towards historic conditions and the desired conditions for vegetation (FW-DC-VEG-01 through 08, FW-DC-VEG-11, and FW-DC-FIRE-03) will restore/maintain the vegetation component of bat habitat nearer to what will have been present under natural disturbance processes.

Timber harvest can remove snags potentially used for roosting, but FW-DC-VEG-07, FW-GDL-VEG-04 and 05, FW-DC-WL-13, and FW-DC-WL-16, provide direction for retaining or improving snag habitat. If timber harvest is done to trend stands towards historic conditions and the desired conditions for vegetation, then vegetation will be nearer to what would have been present under natural disturbance processes. This will provide the snag and vegetation components of bat habitat similar to the conditions and natural disturbance processes they evolved with. FW-DC-WL-15 and FW-GDL-WL-08 provides direction for maintaining unlogged conditions post-fire. This will also aid in providing snags for bat roosting.

FW-GDL-WL-09 and 10 protect abandoned mines/caves and buildings that are used by bats. Both snags and large trees will increase under all alternatives over the next 50 years, as described under the forestwide direction analysis.

There could be a loss of habitat associated with special use permits. Primarily this would be through the loss of snags. Special use permits that involve old buildings can disturb bats or affect roosting habitat. FW-GDL-WL-10 states that buildings should be inspected prior to removal or demolition to determine bat use and then disturbance avoided until bats are gone for the season or removed. FW-GDL-WL-21 provides direction to avoid or minimize disturbance to active roosts or hibernacula.

Minerals development both creates and removes habitat for bats. Underground mines create potential roosting habitat, as do some buildings. The footprint of a mine would remove snags and the potential for snags until reclamation has been completed. New mining developments may be in areas of historic mining, so there may be some disturbance or loss of habitat associated with the loss of old underground mines or buildings. Minerals objective FW-OBJ-MIN-01 for abandoned mines would have a desired outcome of one reclaimed abandoned mine annually. In abandoned mines where bats occur, bat gates or similar structures should be installed as per FW-GDL-WL-09.

Prey Availability: Most fires will continue to be actively suppressed under Alternative A, and the current level of vegetation treatments would continue.

The revised Forest Plan has more flexibility to use fire to trend vegetation towards desired conditions. The desired conditions for vegetation (FW-DC-VEG-01 through 08, FW-DC-VEG-11, and FW-DC-FIRE-03) will provide the stand structures similar to what will have been present under natural disturbance processes, and therefore, the habitats that these bats and their prey evolved with in these ecosystems.

Much of the direction under the “Watershed, Soil, Riparian, and Aquatic Resources” section of the revised Forest Plan will help maintain riparian areas that often provide foraging habitat for bats.

Grazing can impact vegetation, which effects prey abundance. There are no water troughs on the Forest, so there should be no issues with wildlife drowning in them. FW-DC-GRZ-01 states that grazing will occur at sustainable levels while protecting resources. This will reduce the chances of vegetation alteration affecting important sensitive species habitat.

The use of pesticides to control insect outbreaks will potentially kill non-target species and reduce the availability of prey for bats.

Additional direction in the Plan that contributes to prey availability: FW-DC-WL-10, FW-DC-WL-11, FW-DC-WL-12, and FW-DC-WL-14.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetativon changes).

Past activities on NFS lands have potentially impacted bat habitat. Past timber harvest, fuels reduction, and fire suppression have likely altered snag availability in some locations, although across the landscape abundant snags remain. Past mining activities likely created roosting habitat for bats. Old buildings on NFS lands may also provide bat roosting habitat in some instances. Bridges are also another potential roost site for bats that would not have existed historically.

Timber management is likely to continue on non NFS ownerships. Their effects would depend on how many snags are retained, whether forest habitat that is outside of historic conditions is restored, whether large trees are maintained, and the amount of disturbance to bat roosts.

Fuels reduction efforts are possible on all land ownerships, in particular where they are near residences. If these are done in such a way that they restore habitat that has been degraded by fire suppression, then habitat for bats can be improved. If not, then habitat can be lost and connectivity impacted.

White-nose syndrome continues to spread and decimate bat populations. It has not yet reached the western US. Recreational cave/mine exploration on all land ownerships can lead to increased rate of spread of the disease. There is a decontamination protocol in place for NFS owned lands, which should aid in slowing the spread on NFS lands. Cave/mine closures on all ownerships may also aid in slowing the spread.

Grazing will continue on other ownerships, and if it reduces the availability of grasses and shrubs there may be a reduction in bat foraging habitat.

Ski area expansion, utility corridor construction, and mining are all possible future effects that could impact habitat or cause disturbance. Wind turbines can cause mortality to bats and birds.

A changing climate may impact the suitability of habitat and alter prey abundance. As temperatures and moisture regimes change, the peak abundance of insects may shift (e.g., a shift in seasonally available foods for the insects themselves and the bats in turn, page 90 in USDA Forest Service 2010). This may affect the abundance of prey during key periods such as when female bats are caring for their young. Surface temperature changes may change the interior temperatures of caves and abandoned mines due to airflow into the caves. As bats are selective in the microclimates in which they will roost, this may cause bats to shift their use elsewhere inside caves/mines or abandon them altogether. Riparian areas host an abundance of insects, in addition to water for bats, and climate change could alter the quantity/quality of this kind of habitat.

Recreation is likely to increase on all land ownership types, if for no other reason than human population growth. This will increase human disturbance and potentially impact bats on all ownerships. Additionally, many people are intolerant of bats and this can lead to disturbance of bats, loss of access to roost sites, or mortality.

Water pollution can impact prey abundance and also directly impact bats; and stock tanks used for grazing can cause drowning if there are no escape ramps in place.

Impacts to bats during migration are not well understood. Habitat loss along migration routes, including roost sites, may cause populations declines in bats.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for Townsend's big-eared bat. This determination is based in part on:

- FW-GDL-WL-09 and 10 protect abandoned mines/caves and buildings that are used by bats. Additional direction in the revised Forest Plan that protects roosts/hibernacula and minimizes disturbance includes FW-DC-WL-01 and FW-GDL-WL-21;
- FW-DC-WL-16 states that caves, mines, and snags provide areas for roosting, hibernation, or maternity sites for various species of bats;
- FW-GDL-WL-10 states that buildings should be inspected prior to removal or demolition to determine bat use and then disturbance avoided until bats are gone for the season or removed. FW-GDL-WL-21 provides direction to avoid or minimize disturbance at active roosts or hibernacula;
- Direction in the revised Forest Plan that maintains snag habitat includes: FW-DC-VEG-07, FW-GDL-VEG-04 and 05, and FW-DC-WL-13. Snags may be used as roosting habitat by bats; and
- The revised Forest Plan will move vegetation conditions towards a desired condition that will be based on historic conditions (FW-DC-VEG-01 through 08, FW-DC-VEG-11, and FW-DC-FIRE-03). The distribution and amount of bat habitat should be nearer historic levels.

Black-backed Woodpecker – Picoides arcticus

Affected Environment

Burned conifer forests and other insect infested forests provide key conditions necessary for both nesting and foraging for black-backed woodpeckers.

Black-backed woodpecker population biology, ecology, habitat description, and relationships are described in the Birds of North America Online (Dixon and Saab 2000), and incorporated by reference. Additional information is included in the Montana Natural Heritage Program (MNHP and MFWP 2011), and NatureServe databases (2011) and in Partners in Flight bird Conservation Plan (PIF 2000).

In 2006 Samson completed "A conservation assessment of the northern goshawk, black-backed woodpecker, flammulated owl, and pileated woodpecker in the Northern Region, USDA Forest Service" and estimated the amounts of black-backed woodpecker habitat in the northern region, the Northern Rockies Ecoregion and for each of the Northern Region National Forests. Samson also developed habitat estimates for maintaining viable populations of each of these species including the black-backed woodpecker in Region 1 (Samson 2006). Bush and Lundberg (2008) provided an update of habitat estimates for the Region One Conservation Assessment.

Hoffman (1997 cited in Bonn et al. 2007) suggests that an analysis for species such as the black-backed woodpecker (such as viability analysis) should be conducted at the regional scale. This write-up discusses the black-backed woodpecker at both the regional scale as well as for the IPNF.

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes). The ERG analysis (ERG 2012) looked at vegetation changes over the next 50 years. Consideration was also given to a broader context for black-backed woodpeckers compared to some of the less mobile species due to their known ability to move great distances to recently burned habitat.

Habitat and Life History Needs

Wisdom et al. (2000) identify source habitats for black-backed woodpeckers as late seral multi - and single-layered stages of the subalpine, montane, and lower montane communities. They have a preference for dead and decaying trees for perching and foraging, and are highly associated with recent burns. Stand replacing large burns and other beetle infested stands provide high concentrations of prey (wood boring beetles) for black-backed woodpeckers (Koplin 1969 cited in Wisdom et al. 2000).

Black-backed woodpeckers are highly responsive to forest fire and other processes, such as spruce budworm outbreaks, that result in high concentrations of wood boring insects invading dead trees. Local and regional irruptions and range extensions have been observed in response to burns and wood borer outbreaks (Yunick 1985 in NatureServe 2011). In Montana, habitat includes early successional, burned forest of mixed conifer, lodgepole pine, Douglas-fir, and spruce-fir (Hutto 1995a, 1995b cited in MNHP and MFWP 2011) although they are more numerous in lower elevation Douglas-fir and pine forest habitats than in higher subalpine spruce forest habitats (Bock and Bock 1974 cited in MNHP and MFWP 2011). They appear to concentrate in recently burned forest and remain for several years (3 to 5) before leaving due to prey source decline (Harris 1982 cited in MNHP and MFWP 2011). Two post fire factors appear to be necessary for the black-backed woodpecker; nests found were in snags that had evidence of decay before the fire and a healthy number of snags before a fire is important.

Black-backed woodpeckers nest in live and dead trees of various species and often excavate a nest in sapwood, which decays more quickly than heartwood (Dixon and Saab 2000). The bulk of the diet of black-backed woodpeckers is wood-boring beetle larvae (including *Monochamus spp*. and Englemann spruce beetle, *Dendroctonus englamanni*), but they also feed on other insects (e.g., weevils, beetles, spiders, ants). Occasionally they will eat fruits, nuts, sap, and cambium. Foraging in western Montana was primarily by pecking, with scaling the next most common technique (NHP 2007). To provide plenty of wood-boring beetle grubs to feed their young, dead trees have to be plentiful and clumped close together. In between burns, black-backed woodpeckers disperse and must rely on stands of insect ridden trees for survival generally in late seral forests and riparian woodlands (Wisdom et al. 2000). Snags (ponderosa pine, lodgepole pine and larch) are a special habitat feature for black-backed woodpecker.

Habitat Estimates

Burned Forest/Insect and Disease Forests

Samson (2006a) in his conservation assessment for the black-backed woodpecker found that there has been a significant increase in the amount of fire throughout Region 1 when he compared the amount of fire between two timeframes 1990-1993 (66,743 acres) and 2000-2003 (1,139,537 acres). He also found a similar situation related to insect and disease throughout the region, including the IPNF.

Throughout the northern region (including the Forest) Samson (2006a) in his conservation assessment demonstrated that habitat for black-backed woodpecker is well distributed, well connected, and there are no gaps that would limit black-backed woodpecker movements.

Table 61 displays by decade the amount of acres burned on the IPNF over the past several decades.

Table 61. Estimated Acres Burned by Decade on the Forest

Decade	Acres Burned
2000 - present	17,600
1990 - 1999	6,800
1980 - 1989	4,800
1970 - 1979	10,700

After extensive fires in the early part of the century (1910 – 1930) that burned well over a million acres, the amount of burned forest on the IPNF has been relatively small. Large acreages of fire also burned between the years of 1960-1969 (>78,000 acres) and most recently there has been an increase from the previous two decades. It is likely that the amount of burned forest, in combination with insect and disease killed stands, provided a large amount of habitat for both species over the past decade.

Black-backed woodpecker habitat was modeled by Ecosystem Research Group (ERG) in 2012 (ERG 2012). ERG modeled several scenarios for comparison purposes. Table 62 displays two of the relevant scenarios. The existing 1987 Forest Plan was modeled, as was a “no treatment” scenario where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. Both consider a warmer/drier climate over the next five decades as the climate changes. Both of these scenarios also considered that the current level of fire suppression would continue into the future and both considered an increase in acres burned over time due to a warmer/drier climate and fuel loads. Under both scenarios the acreage of black-backed woodpecker habitat is comparable to existing conditions after about five decades.

Table 62. Acres of Black-backed Woodpecker Habitat

Decade	1987 Forest Plan (acres)	No Treatment Scenario (acres)
0	14,074	14,074
1	6,069	7,586
2	7,298	8,168
5	17,447	18,505

Source: Ecosystem Research Group 2012. Both scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Wisdom et al. (2000) identified that throughout the interior Columbia Basin there has been a widespread decline (but less severe than the strongest declines identified) in source habitats for species dependent on late-successional forest habitats present over broad elevations, which includes the black-backed woodpecker. Analysis conducted for the Forest (see the “Vegetation” section or this document) also identified a fairly significant reduction in late-successional forest habitats. However, late -successional habitats are still considered to be well distributed across the

Forest. In addition to current late-successional stands, the Forests are managing additional lands for their late-successional characteristics. The current trend is such that late-successional forests are no longer targeted for timber harvest. Over the short- and long-term natural succession will result in an increase in the amount of lands in the large size class and subsequently in the amount of late-successional forest components, such as snags and down wood important.

Snags

A snag analysis recently conducted for the Forest (Bollenbacher et al. 2009) provided an estimate of the number of snags currently existing throughout the forested portion of the Forest. The analysis compared the amount of snags presently occurring in wilderness/roadless areas versus those outside wilderness/roadless areas. The analysis identified that areas outside of wilderness/roadless areas have similar snags per acre to those in wilderness/roadless areas. The snag densities within wilderness/roadless areas provide insight into natural snag abundance and distribution, and this can be compared to areas outside of wilderness/roadless (page 4 in Bollenbacher et al. 2009). The 90 pecent confidence intervals for wilderness/roadless area snags overlap with the confidence intervals for areas outside of wilderness/roadless (table 2 in Bollenbacher et al. 2009). In other words, the number of snags outside of wilderness/roadless areas, which represents natural snag abundance, is not very different than the number of snags outside of wilderness/roadless. Please see the snag discussion in the vegetation section of the FEIS and DEIS (pages 69-72 in the DEIS) for more information regarding the findings of Bollenbacher et al. 2009 and the amount of snags available on the Forest. As the amount of firewood adjacent to roads accessed by the public continues to diminish; access away from roads to patches of snags, especially in late-successional stands, has increased.

Key Stressors

Fire suppression and postfire salvage logging are detrimental to this species.

The following Forest Service management activities may have had direct or indirect effects on black-backed woodpeckers or their habitats that resulted in habitat loss and/or displacement of individuals:

- Timber harvest (salvage logging);
- Fire suppression;
- Removal of fire killed or insect infested trees;
- Conversion of mature and late-successional forests to young stands with few decayed trees; and
- Human disturbance near nest sites (Montana Fish, Wildlife, and Parks 2005).

Their strong association with dying or dead trees infested with beetles may be a key to black-backed woodpecker management. It is the conservation of specific forest seral stages (mainly mature and late-successional), therefore that may ultimately determine the baseline populations and viability of black-backed woodpeckers. Focusing only on burned areas as a management approach may jeopardize their long-term viability. Mature and late-successional forests containing patches of beetle infested trees may provide adequate habitat to support baseline populations of black-backed woodpeckers when burned areas are not available (Goggans et al. 1988). It is important to recognize that large scale disturbances may be more important in maintaining their populations now than in historical times due to the reduction of all late-successional forests and the increase in “salvage” logging techniques which remove dying, and recently killed trees throughout North America (Ibid).

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Timber Harvest/Salvage: Fire creates habitat for black-backed woodpeckers. Fuels have accumulated due to fire suppression, and fires are more likely to create larger patches than under historic conditions due to the continuity of fuels. Under historic conditions and without fire suppression, patch sizes would likely have been smaller and there would have been a mosaic of stand ages; although, even under historic conditions large scale disturbance was possible (e.g., 1910 fires). Fuels reduction/burning (active restoration) and the use of natural, unplanned ignitions (passive restoration) will restore/maintain conditions nearer to historic conditions and make them more sustainable and resilient to large-scale disturbance. Instead of having large-scale disturbance and converting large acreages to black-backed woodpecker habitat in the short-term, smaller scale disturbances will create a mosaic of habitat conditions and allow for a continued supply of black-backed woodpecker habitat over time. FW-DC-WL-15 and FW-GDL-WL-08 will maintain habitat post-disturbance to provide for the habitat requirements of species such as the black-backed woodpecker that rely on recently burned/disturbed forest. Use of natural, unplanned ignitions, implemented through FW-DC-FIRE-03, will be useful for maintaining burned habitat for black-backed woodpeckers over time.

Salvage logging reduces the amount of black-backed woodpecker habitat; however, adequate habitat will be retained for wildlife habitat as per FW-DC-TBR-01.

Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year). Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives, with 6,000 acres/year of prescribed burning in Alternative A. Of the alternatives, B Modified (1,683 acres) will be expected to have more regeneration treatments per year under constrained budgets in the first decade, followed by C (1,677 acres), D (1,607 acres) and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) will be expected to have more regeneration treatments per year under unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres) and then A (5,537 acres).

Fire wood gathering will be facilitated by open roads, but due to tree density and topography it will be difficult for firewood gathers to cut snags very far off of a road. Although firewood gathering does result in a loss of snags, typically there are far more acres that are inaccessible to firewood gathers on the Forest that provides black-backed woodpecker habitat.

Fire Suppression: The use of natural, unplanned ignitions (passive restoration) will have a much greater likelihood of maintaining or improving habitat pattern across the Forest. Most fires are likely to be suppressed under Alternative A. Alternative A (current Forest Plan as implemented) will be more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire to restore/maintain habitat. The use of natural unplanned ignitions (passive restoration) would be more likely in MA1, and Alternative C (335,300 acres) would have the most MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and A (153,900 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

In addition to FW-DC-FIRE-03, MA direction in the revised Forest Plan that supports expanded use of natural, unplanned ignitions and planned ignitions includes: MA1a-DC-VEG-01, MA1a-DC-FIRE-01, MA1a-GDL-FIRE-01 and 02, MA1b-DC-VEG-01, MA1b-DC-FIRE-01, MA1b-GDL-FIRE-01 and 02, MA1c-DC-VEG-01, MA1c-DC-FIRE-01, MA1c-GDL-FIRE-01 and 02, MA1e-DC-VEG-01, MA1e-DC-FIRE-01, MA1e-GDL-FIRE-01 and 02,MA2a-DC-FIRE-01, MA2a-DC-VEG-01, MA2a-GDL-FIRE-01 through 03, MA2b-DC-VEG-01, MA2b-DC-FIRE-01, MA2b-GDL-FIRE-01 through 03,MA5-DC-VEG-01, MA5-DC-FIRE-01, and MA5-GDL-FIRE-01. Fire will be more likely to play a more natural role on more of the landscape under the action alternatives compared to Alternative A.

Black-backed woodpecker habitat was modeled by Ecosystem Research Group (ERG) in 2012 (ERG 2012). ERG modeled several scenarios for comparison purposes. Table 63 displays three of the relevant scenarios. The existing 1987 Forest Plan was modeled, as was a “no treatment” scenario where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. These scenarios consider a warmer/drier climate over the next five decades as the climate changes. These scenarios also considered that the current level of fire suppression would continue into the future and considered an increase in acres burned over time due to a warmer/drier climate and fuel loads. Under all alternatives the acreage of black-backed woodpecker habitat increases from decade 1 through decade 5. The lesser amount at decade 5 for Alternative B Modified is likely due to the anticipated success of management actions to reduce the severity of fire. ERG concluded that black-backed woodpeckers are at no risk region-wide. This conclusion is based on the ability of black-backed woodpeckers to migrate across forest boundaries to exploit wildfires and their genetic relatedness suggests that they readily do this. The IPNF is expected to provide substantial burned forest habitat over time (page 83 in ERG 2012).

Table 63. Acres of Black-backed Woodpecker Habitat

Decade	Alternative B Modified (acres)	1987 Forest Plan (acres)	No Treatment Scenario (acres)
0	14,074	14,074	14,074
1	4,934	6,069	7,586
2	6,799	7,298	8,168
5	15,122	17,447	18,505

Source: Ecosystem Research Group 2012. These scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

For black-backed woodpeckers, as with wildlife on the Forest in general, it is wildfire, insects/disease, in-growth, and stand succession that largely determines the amount and pattern of habitat on the Forest for this species rather than management activities (pages ES-1 and ES-2 in ERG 2012).

Mehl et al. (2009) developed a report for the Idaho Department of Lands (IDL) that examined IDL’s goal of restoring/maintaining a 20 percent representation of historic habitat conditions on their lands in north Idaho. They assumed that the same 20 percent would be met on other land ownerships as well. For black-backed woodpeckers, the high likelihood of future fires, particularly high severity fires due to climate change, would maintain habitat conditions into the future (page 210 in Mehl et al. 2009). They stated that the objectives are not to return the entire landscape to historic conditions, but to provide sufficient amounts of similar ecosystems represented across the landscape to maintain native species (page 43 in Mehl et al. 2009). The revised Forest Plan for the IPNF does far more than aim to restore/maintain only 20 percent of historic habitat conditions for native species. The desired conditions for vegetation in the revised Forest Plan are based on historic conditions and natural disturbance processes rather than aiming for a lower percentage of representation of historic habitats.

Disturbance at Nests: Most disturbances are likely to occur near roads due to the ease of human access. Alternative A will retain the existing amount of recommended wilderness and non-motorized areas. Large areas with limitations on motorized use can aid in providing habitat for black-backed woodpeckers that will be relatively disturbance free. Alternative C (2,129,490 acres motor vehicle use) will have the least acreage allowing motor vehicle use, followed by Alternatives B Modified (2,268,390 acres motor vehicle use) D (2,279,590 acres motor vehicle use) and A (2,399,138 acres motor vehicle use).Alternative C (335,300 acres) would have the most land in MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and Alternatives A (153,900 acres).

FW-GDL-WL-25 sets timing restrictions and distance buffers around known nest sites of sensitive species using the best available information to reduce disturbance. FW-DC-WL-01 states that sensitive species nest sites are relatively free of human disturbance.

Recreation most often occurs near open roads, which is also the same area where firewood gathering will be most likely to occur. Recreation/human presence may cause disturbance that will cause black-backed woodpeckers to avoid the area, in particular near open roads. Disturbance due to firewood gathering could also cause them to avoid those areas. There will be bark beetle infested trees found away from roads on the Forest that will provide habitat for black-backed woodpeckers with less human presence.

Mining activities could reduce the amount of potential habitat, but the footprint will likely be small in comparison to the entire Forest. A mine will remove trees and therefore those trees will not have a chance to die in a fire or other disturbance. Until the mine site is reclaimed, there will not be any black-backed woodpecker habitat on that site. A haul/supply route could also remove trees, and if that route is open to the public it could increase firewood harvest along that road if it is not an existing open road. Disturbance associated with the mine or haul/supply route may cause black-backed woodpeckers to avoid the area adjacent to the activities. Livestock management activities (e.g., fence building), special use permits, and the collection of forest products could all result in disturbance to black-backed woodpeckers. Suitable habitat is ephemeral, so activities that currently do not disturb black-backed woodpeckers may do so in the future if suitable habitat develops nearby. FW-GDL-WL-25 sets timing restrictions and distance buffers around known nest sites of sensitive species using the best available information to reduce disturbance. FW-DC-WL-01 states that sensitive species nest sites are relatively free of human disturbance.

Large areas with limitations on motorized use can aid in providing habitat for black-backed woodpeckers that would be relatively disturbance free. Alternative C (2,129,490 acres motor vehicle use) would have the least acreage allowing motorized use, followed by Alternatives B Modified (2,268,390 acres motor vehicle use), D (2,279,590 acres motor vehicle use) and A (2,399,138 acres motor vehicle use).Alternative C (335,300 acres) would have the most land in MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and Alternatives A (153,900 acres).

Cumulative Effects

Please see the "Cumulative Effects Common to Most Species" section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the "Cumulative Effects Common to Most Species" section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past fire suppression and then salvage logging when fires did occur likely altered the availability and pattern of habitat for black-backed woodpeckers on the Forest.

Timber management and salvage logging are likely to continue on non-NFS ownerships. Stands burned on private lands are more likely to be salvaged logged than on the Forest. This will reduce the amount of habitat available following those disturbances.

Climate change could impact the amount and distribution of black-backed woodpecker habitat on the Forest. Combined with past fire suppression, climate change may lead to an increase in black-backed woodpecker habitat. This is because of the increased susceptibility to large-scale disturbance as more of the Forest moves outside of historic conditions. More, and larger, bark beetle outbreaks will provide a more abundant food source for black-backed woodpeckers. However, as bark-beetles decline in impacted stands after the first several years of an attack, the suitability of those stands as black-backed woodpecker habitat will decline over time following an outbreak. If these outbreaks are over a large-scale, then the long-term sustainability of black-backed woodpecker habitat may be impacted. If stands are restored nearer to historic conditions, and are more sustainable and resilient to large-scale disturbance, then disturbances will likely occur at smaller scales. That will provide a mosaic of stand conditions across the Forest and sustain a moving distribution of black-backed woodpecker habitat in the long-term. Highly mobile species, such as the black-backed woodpecker, are able to respond better to climate change (page 91 in USDA Forest Service 2010).

Fire is more likely to be suppressed near homes, and dead/dying trees salvaged logged to reduce fuels.

The action alternatives will contribute towards improving habitat for black-backed woodpeckers. This is due to returning conditions nearer to historic conditions, facilitating the development of smaller amounts of suitable habitat over time rather than one large influx of habitat due to a large-scale disturbance.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for black-backed woodpecker. This determination is based in part on:

- FW-DC-WL-15 and FW-GDL-WL-08 will maintain some burned, unlogged habitat for species such as black-backed woodpeckers. Other direction in the revised Forest Plan that maintains snag habitat includes: FW-DC-VEG-07, FW-GDL-VEG-04 and 05, and FW-DC-WL-13;

- The percentage of the Forest with high snag densities will increase over the next five decades;
- Use of natural, unplanned ignitions implemented through FW-DC-FIRE-03 and MA direction, will be useful for maintaining burned habitat for black-backed woodpeckers over time;
- The IPNF is expected to provide substantial burned forest habitat over time (page 83 in ERG 2012);
- Salvage logging reduces the amount of black-backed woodpecker habitat; however, adequate habitat will be retained for wildlife habitat as per FW-DC-TBR-01; and
- Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives.

Black Swift– Cypseloides niger

Affected Environment

Black swift population biology, ecology, habitat description and relationships are described in the Birds of North America Online (Lowther and Collins 2002) and incorporated by reference. Additional information is included in the Montana Natural Heritage Program (MNHP and MFWP 2011), NatureServe databases (2011) and in Montana Partners in Flight bird Conservation Plan (PIF 2000).

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Habitat and Life History Needs

Known breeding populations of black swifts are closely associated with mountain waterfalls, caves or coastal cliffs. They forage over forests and in open areas by catching insects in the air, often at great heights and feed on caddisflies, mayflies, beetles, flesh flies, hymenoptera and other insects (Groves et al. 1997a). Requirements for nesting include water, high relief, inaccessibility, darkness, and unobstructed flyways (MNHP and MFWP 2011). Other nesting habitat requirements appear to be; cliff sites that are inaccessible from ground predators, ledges or pockets on cliff walls, and moss availability. Where adequate space allows, nesting is often colonial.

There are several waterfalls scattered throughout Forests. The majority of these are associated with forested environments and do not provide suitable habitat for foraging by black swift. High elevation habitats that contain waterfalls with rock cliffs and open type environments similar to those required occur in only a limited number of locations on the Forests. There has been no change in these habitat components on the Forests. Black swifts have been sighted at several waterfalls on the Forest during the nesting season.

Key Stressors

Throughout its range; a decrease in water flows, and recreational use of nest sites by rock climbers, swimmers, and hikers are two of the biggest threats to this species (MPIF 2000). This can cause disturbance, displacement, or nest abandonment. On the IPNF there are two documented nesting sites and a number of suitable falls with potential nesting habitat. Given the location of black swift nest sites on cliffs with limited accessibility and the relatively low level of recreation around possible black swift nesting sites, the potential for nest site disturbance is considered relatively low, although still possible.

Environmental Consequences – Black Swift

Effects Related to Key Stressors under Forest Service Control

Disturbance at Nests: On the Forest, recreation would be the most likely cause of disturbance for the black swift. However, this effect would be considered small due to the limited accessibility of potential nest sites and the relatively low level of recreation near those sites. Recreational activities that may impact black swifts are rock climbers, hikers, or swimmers attracted by the waterfalls where these birds nest. The areas where suitable waterfalls are found are generally at higher elevations on the Forest and in open habitats. Those are more likely to be found in wilderness or other areas with limited access. If disturbance does occur, it may cause individual birds to at least temporarily avoid the area. Nest abandonment could occur if the disturbance becomes great enough, and nesting habitat is naturally limited on the Forest. However, given the limited accessibility of these sites, nest site disturbance would be considered relatively low. FW-DC-WL-01 states that lands surrounding nests of sensitive species are relatively free of human disturbance and FW-GDL-WL-25 states that timing restrictions and distance buffers around nests would be used in order to reduce effects from disturbance.

Special uses are likely not currently impacting black swift habitat or causing disturbance due to the limited extent and inaccessible nature of nesting habitat. Disturbance related to other management activities such as timber harvest are expected to be minimal or nonexistent due to the inaccessible nature of nest sites and the lack of active management in those areas.

There would likely be very limited effects from the collection of other forest products on black swift habitat. Nesting habitat for black swifts generally does not have forest products such as firewood, Christmas trees, boughs, mushrooms, or other commonly collected items. Because of this, there would be a low likelihood of disturbance effects to black swifts.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Black swift habitat, because it occurs at higher elevation, relatively inaccessible sites, is more likely to occur on the Forest rather than other ownerships. Any potential habitat on other ownerships would likely be exposed to similar kinds of disturbance and effects. High elevation waterfalls tend to be inaccessible, and black swifts prefer open habitats, so timber management is likely to result in only small effects. Recreational activities are the most likely impact on NFS lands to black swifts, although the level of impact is likely tied to the accessibility of the site.

If climate change causes a shift in snowfall amounts/timing, spring melt off amounts/timing, and other habitat changes, then black swifts could be affected. Black swifts nest near waterfalls and feed on insects. A change in water flow may alter the suitability of the habitat. Changes in temperatures and humidity on the cliff faces may alter the availability of mosses used for nesting. Insect hatches may be affected by climate change, so prey availability may change at the nest sites (page 90 in USDA Forest Service 2010). The exact effects and extent of climate change at the nest sites would be difficult to predict, so the response of black swifts would be difficult to predict. If nesting habitat changes to the extent that it becomes unsuitable, then black swifts would have to use habitat elsewhere. Given the limited availability of habitat, it may be difficult to find habitat elsewhere on the Forest. It would be unknown or difficult to predict if any waterfalls that currently exist on the Forest that do not provide suitable habitat because they are within forested habitats would someday become suitable due to climate change.

Subdivision of private property is unlikely to impact black swift habitat because subdivision isn't likely to occur at higher elevation, inaccessible sites.

The action alternatives would contribute towards maintaining habitat for black swifts. This is due to maintaining or increasing the amount of non-motorized backcountry or wilderness.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for common loon. This determination is based in part on:

- On the Forest, recreation would be the most likely cause of disturbance for the black swift. However, this effect would be considered small due to the limited accessibility of potential nest sites and the relatively low level of recreation near those sites;
- FW-DC-WL-01 states that sensitive species' nests are surrounded by lands that are relatively free of human disturbance during the periods the species would be active at the site. FW-DC-WL-25 sets timing restrictions and distance buffers around known nests based on the best available information for the species. This direction would reduce potential disturbance to nesting black swifts; and
- Much of the direction under the Watershed, Soil, Riparian, and Aquatic Resources section of the revised Forest Plan would maintain or improve riparian habitats and would therefore maintain or improve habitat for black swifts. That direction would provide the riparian and aquatic habitat useful to provide the insect prey base for black swifts.

Common loon – Gavia immer

Affected Environment

Common loon population biology, ecology, habitat description, and relationships identified by research are described in Skaar (1990), Dolan (1994), Evers (2004) and Bissell (2005) and incorporated by reference. Sources of ecological and occurrence information is available from state agencies, Montana Natural Heritage Program, and Federal agencies that have developed shorebird and waterbird conservation plans.

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan.

Habitat and Life History Needs

Successful nesting requires both nesting sites and nursery areas sheltered from winds and disturbances. In Montana common loons will generally not nest on lakes less than about 13 acres in size or over 5,000 feet in elevation (Skaar 1990 in PIF 2000). If nesting on a small lake, they may use an adjacent lake for supplementary foraging (Ibid). Small islands (preferred) or herbaceous shoreline areas are selected for nesting and sheltered shallow coves with abundant insects and small fish are used as nursery areas (Skaar 1990 in PIF 2000). Most lakes inhabited by loons are relatively oligotrophic and have not experienced significant siltation or other hydrological changes. During migration a wide variety of open water habitats are used, but larger lakes and rivers are preferred (PIF 2000).

Water quality is an important habitat feature for breeding loon success. Loons are visual predators; therefore, clear water is crucial for foraging efficiency. Loons nest in close proximity to the water's edge and prefer small islands, floating bog mats, and marshy hummocks (Evers 2004). Nest sites are generally located within 4 feet of the water's edge and sites are selected that provide shelter from wind, cover, view of open water, and near a drop off steep enough for underwater approach. Once the eggs have hatched and the young are ready to leave the nest, the family moves to a nursery area, a shallow water area protected from wind, waves, and other loons. Loons feed mostly on small fish such as yellow perch and various minnow species. Other aquatic organisms may also be consumed.

Because disturbance of nesting pairs is one of the major stressors of loons, land ownership around nesting lakes is considered important, and is a primary factor in the management opportunities available for this species. It is likely that development around many of these lakes will continue in the future and potentially impact loon nesting and rearing activities. NFS lands provide access to several lakes with loon nesting activity, generally in the form of recreation sites, such as campgrounds and boat access sites.

Key Stressors to the Species (Risks and Threats)

Evers (2004) and NatureServe (2011) identified the following threats to common loons considered to be outside the control of the forest. These may also cause mortality, nest abandonment, or displacement:

- Direct anthropogenic take **–** (illegal take through hunting). Subsistence hunting is still common and practiced across Alaska, northern Canada, and Greenland;
- Commercial fishing activities **–** incidentally caught in nets by commercial and tribal fishing interests;
- Environmental pollutants such as **–** marine oil spills, contaminants (mercury, lead, organic pollutants), acid rain;
- Diseases and parasites **–** botulism, aspergillosus, and other diseases;
- Reservoir management **–** water level fluctuation;
- Emaciation syndrome **–** a regular mortality problem for wintering loons and may be one of the greatest threats to common loons; and
- Nest predation.

The following stressors may also cause mortality, nest abandonment, or displacement.

Common loons are vulnerable to habitat loss and/or degradation on both breeding and wintering grounds. Major threats to loons are disturbances to nesting pairs caused by recreational activities, habitat loss due to shoreline development, and water pollution (Evers 2004, NatureServe 2011, and PIF 2000). Human recreational use of nesting and nursery sites may force loons into marginal, less protected nesting sites where chicks are more susceptible to predation when forced to separate from their parents by boats, jet skis, or any human intrusion. Chicks are also killed by direct impact from outboard propellers and more often jet skis (McIntyre and Barr 1997 in IDFG 2005).

Water quality degradation from point sources such as faulty septic systems, or more generally from road building, timber harvest, or other activities near nesting lakes also has the potential to change prey populations and vegetation patterns at nesting lakes. Resultant changes in nest site suitability or nest success may occur. Manipulation of water levels can also reduce the suitability of lakes and reservoirs as feeding or nesting sites.

Montana Partners in Flight (PIF 2000) identify that minimization of development and recreation activities on known nesting lakes, at least during useful portions of the breeding cycle, is perhaps the best means of managing loon habitat. Posting of nesting or nursery lakes most susceptible to disturbance has been shown to be effective.

Activities on national forest lands that may impact common loons include; water level fluctuations, human disturbance of nest sites, development, and access. The majority of the lakes used by these species are situated on private lands or managed by other federal (waterfowl production areas and refuges managed by USFWS) or state agencies. There are occasions however, where Forest Service lands may occur adjacent to these open water systems and may indirectly affect species by providing access and/or resulting in disturbance.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Disturbance: Disturbance effects are the most likely to occur on NFS lands or be facilitated by access through NFS lands. Some lakes that have loons are adjacent to private or state lands, and most disturbances are likely to come from the private lands/residences. NFS roads, campgrounds, and boat ramps that facilitate access to lakes with loons can contribute to disturbance as well. Lakes tend to be popular recreation destinations, so on lakes with mixed ownerships disturbance will be likely.

Lakes where disturbance of loons was considered a problem under current management, in coordination with the state, restrictions on motorized use have been put in place. FW-GDL-WL-24 provides direction to avoid or minimize disturbance near nests, and FW-DC-WL-01 states that sensitive species nest sites are relatively free of human disturbance. FW-DC-WL-10 states that aquatic/riparian species find a mosaic of aquatic and riparian habitats and a low level of disturbance exists in these areas. Special uses that occur on or adjacent to lakes may cause disturbance to loons. Minerals development that may occur adjacent to lakes may disturb loons and cause them to avoid the area. Additionally, any haul/supply route that passes a lake and greatly increases noise and traffic may add to disturbance to loons. Disturbance caused by the collection of forest products will not likely be great. For disturbance to occur it would require people to be immediately adjacent to a section of lake that a loon was using. It would be relatively rare for this to occur, but if it did, loons may temporarily shift their use to another part of the lake.

Fire may cause some disturbance to loons due to smoke, but the most impactful disturbance may be associated with fire suppression activities. Helicopters in particular, either flying low over a lake or dipping water, can cause disturbance to loons. Fire suppression has led to a buildup of fuels, and fuels reduction activities in close proximity to lakes with loons can potentially cause disturbance. Lakes with private residences around them are the most likely to have active fire suppression in order to protect the private property and people.

Timber harvest that includes helicopter logging would be the most likely to disturb loons. FW-DC-WL-01, FW-DC-WL-11, and FW-GDL-WL-224 will be the direction in the revised Forest Plan that would minimize disturbance to loons.

A trend towards the desired conditions for vegetation may improve habitat conditions for loons by reducing the duration and intensity of smoke during a fire. Moving towards historic conditions, reducing fuels, and making stands more resilient to large-scale disturbance may increase the frequency of smoke exposure, but will decrease the likelihood of a large, stand-replacing fire. Smaller, more frequent burns will be more likely on drier sites.

Water Levels: INFISH guides current management of aquatic/riparian resources and has been incorporated into the revised Plan. Much of the direction in the “Watershed, Soil, Riparian, and Aquatic Resources” section of the revised Forest Plan will aid in maintaining water levels and quality and will therefore maintain or improve loon habitat. Climate and annual precipitation primarily determine water levels on lakes adjacent to NFS lands, but they can also be determined by water uses that are outside the control of the Forest Service (e.g., irrigation, hydro-power). The Forest Service may, in some cases, have little control over water levels on lakes that are not completely managed by the Forest Service.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan.

Recreational activities are the most likely activity to have caused disturbance or impacted loons on NFS lands. Information/education efforts have been utilized to limit those effects.

Timber management, including helicopter logging, may continue on non-NFS ownerships. If done near a lake, disturbance to loons could result.

Climate change could affect loons through changes in water levels, temperatures, and vegetation. If climate change alters precipitation and spring melt, water levels may fluctuate more in the spring during nesting then they may have previously. This may impact nesting if nests become submerged or become elevated as the water level decreases. Water temperatures may impact the suitability of lakes for different fish species, thereby changing prey abundance. Aquatic vegetation, important for nests, may change locations in a lake due to water level fluctuations, and this may change nest site availability. This changing phenology is one of the consequences of climate change for migratory birds (page 90 in USDA Forest Service 2010).

Recreation is likely to increase on all land ownership types, if for no other reason than human population growth. This would increase human disturbance and potentially impact lake habitat on all ownerships. As on NFS lands, disturbance associated with human presence and most management activities would likely continue. Subdivision of private property has the potential to alter areas around lakes and increase disturbance. Fire is more likely to be suppressed near homes, and dead/dying trees salvaged logged to reduce fuels.

Loons may be directly killed by illegal hunting, subsistence hunting in Canada, or getting caught in commercial fishing nets on their wintering waters. Environmental pollutants can kill loons through lead or mercury poisoning and marine oil spills. Habitat can be degraded through pollution, including impacts on loon prey and consequently displacing loons. Land use activities near waterbodies that support nesting loons can contribute pollution, such as faulty septic systems.

Diseases and parasites (botulism, aspergillosus, and other diseases), and emaciation syndrome, can cause mortality to loons and impact the population. Nest predation, or predation on juveniles when they become separated from adults, also can impact a population.

Reservoir management can cause water level fluctuation and consequently nest failure. Shoreline development increases disturbance and can degrade habitat. Because loons are susceptible to disturbance, increases in recreation can cause displacement, nest abandonment, or direct mortality.

The action alternatives will contribute towards improving or maintaining habitat for loons. FW-GDL-WL-24 provides direction to avoid or minimize disturbance from Forest Service activities near nests.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for common loon. This determination is based in part on:

- FW-GDL-WL-24 provides direction to avoid or minimize disturbance near nests, and FW-DC-WL-01 states that sensitive species nest sites are relatively free of human disturbance. FW-DC-WL-11 states that aquatic/riparian species find a mosaic of aquatic and riparian habitats and a low level of disturbance exists in these areas. This direction works best where lakes are completely surrounded by NFS lands; and
- Much of the direction in the “Watershed, Soil, Riparian, and Aquatic Resources” section of the revised Forest Plan will aid in maintaining water levels and quality and will therefore maintain or improve loon habitat.

Fisher – Martes pennanti

Affected Environment

The fisher is one of a group of carnivores that occur on the Forest. Carnivores are important indicators of ecosystem integrity in that they influence the structure and reflect the vigor of the trophic levels upon which they depend. Information on carnivore conservation and management is discussed in Witmer et al. (1998) for the Interior Columbia Basin. Several carnivores in the western United States have declined dramatically in the last century and a half and are listed as threatened or endangered species or are considered sensitive by land management agencies

(Noss et al. 1996, cited in Witmer et al. 1998). These species are mostly far ranging, elusive, shy and inconspicuous, occur in low densities and are active mainly at night (Kucera and Zielinski 1995). Many of these species tend to be wilderness-oriented, are largely intolerant of human activities, and have large spatial requirements. Therefore, the key common feature appears to be remote and secure habitats.

Fisher population ecology, biology, habitat description, and relationships identified by research are described in Powell and Zielinski (1994), Heinemeyer and Jones (1994), Rugierro et al. (1994) and Vinkey (2003). That information is incorporated by reference. Additional information is found in the Montana Natural Heritage Program, Idaho Data Conservation Center and NatureServe databases. Additional research and data collection are in progress by the researchers and state agencies elsewhere in Montana and Idaho. Information on fisher augmentation/introduction is described by Vinkey (2003). Information on source habitats is described in Wisdom et al. (2000).

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetative changes). The ERG analysis (ERG 2012) looked at vegetation changes over the next 50 years.

Habitat and Life History Needs

Fishers are a rare predator found in mature to late-successional forests with high canopy closure and large tree (both live and dead) structure. They avoid large openings. Natal dens have been located in pileated woodpecker cavities (Aubry and Raley 2002) and other forest structures. Fishers are found in forested habitats that display extensive physical structure, including snags for dens, multilayered canopies to protect against predation, down logs for denning and resting (Aubry 2005, Powell and Zielinski 1994, Wisdom et al. 2000), and coarse woody debris to provide prey (Douglas and Strickland 1987, Buskirk and Powell 1994, Powell and Zielinski 1994, all cited in Vinkey 2003). Moist forested habitats with continuous overhead cover and riparian zones are frequently utilized (Arthur et al. 1989, Jones 1991, Weir 1995 all cited in Vinkey 2003) and stream courses may be used as travel corridors (IDFG 2005).

Fishers hunt for prey on the forest floor and in trees and snags (Spahr et al. 1991). Fisher are noted for their ability to prey on porcupines; however, their list of prey species is extensive including numerous small mammals, reptiles, amphibians, bird eggs, fish, and fruit (Heinemeyer and Jones 1994;pages 7-8). Major winter foods include carrion, snowshoe hare, mice, and voles.

Vegetation management and fire suppression have influenced habitat of this species and its prey by altering composition and structure. High quality habitats for the fisher, unlike that for grizzly bear, are not strongly associated with low levels of human population and roads (Carroll et al. 2001).

Habitat Estimates

Estimates of the amount of habitat currently available for the fisher (Bush and Lundberg 2008) in the northern region (Samson 2006a), show that habitat is abundant and well distributed across the Northern Region by Ecological Province and National Forest. Habitat estimates for the Northern Region, the Northern Rocky Mountain Ecological Province (which includes the Forest) (Bush and Lundberg 2008).

Table 64. Habitat Estimates for Fisher (acres)

	Region 1	Northern Rocky Mountain Ecological Province
Winter Habitat	6,251,386	4,043,154
Summer Habitat	2,293,408	1,526,712

Fisher habitat was modeled by Ecosystem Research Group (ERG) in 2012 (ERG 2012). ERG modeled several scenarios for comparison purposes. Table 65 displays two of the relevant scenarios. The existing 1987 Forest Plan was modeled, as was a “no treatment” scenario where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. Both consider a warmer/drier climate over the next five decades as the climate changes. Both of these scenarios also considered that the current level of fire suppression would continue into the future and both considered an increase in acres burned over time due to a warmer/drier climate and fuel loads. Over the next five decades wildfire and root disease are the expected causes of the decline in fisher habitat availability. Even though habitat declines, it remains within HRV and there is no indication that fisher viability is at risk (page 85 in ERG 2012).

Table 65. Acres of Fisher Habitat

Decade	1987 Forest Plan (acres)	No Treatment Scenario (acres)
0	1,156,387	1,156,387
1	857,677	862,631
2	772,544	761,735
5	755,169	739,428

Source: Ecosystem Research Group (2012). Both scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Habitat Threshold

Samson (2006a) in his conservation assessment estimated the critical habitat threshold for a minimum viable population of fisher for the Northern Region. For his assessment Samson estimated that the amount of habitat needed for a minimum viable population of fisher is 100,077 acres (approximately 405 km2). Based on an estimate of the amount of habitat available (Bush and Lundberg 2008), the Northern Region (2,293,408 acres) easily provides enough habitat to support a minimum viable population of fisher. In fact, habitat estimates (Bush and Lundberg 2008) identify that habitat in the Northern Rocky Mountain Ecological Province and in 8 of the 12 National Forests in the Northern Region (including the Kootenai) exceed the amount of habitat needed to support a minimum viable population of fisher.

Key Stressors

The following Forest Service management activities may have direct or indirect effects on forested and riparian habitats:

- Timber Harvest **–** changes in mature and late-successional forest stand composition and structure affecting canopy cover and the amount and availability of large down wood; and
- Fire (both planned ignitions and natural, unplanned ignitions) **–** removal of standing snags and down wood, reduction of canopy coverage, or direct mortality.

Stressors to this species group that are outside the control of Forest Service management may include (cumulative effects):

- Global warming (climate change) **–** increased and prolonged summer temperatures and/or drought conditions, and/or the increased risk of fire that may impact forest cover and down wood;
- Private land development **–** developments to support increased human populations that may impact suitable forest cover on non-public lands, and impact connectivity between public lands;
- Over-harvesting by trappers **–** both allowable and incidental trapping with marten traps may be an important source of mortality, particularly where populations are small and fragmented (cumulative effect);
- Habitat loss and degradation **–** loss of forested habitat, particularly late-successional forests, to fire and timber harvest results in the reduction and fragmentation of suitable habitat. Loss of habitat cover and structure near streams, loss of down and woody material near streams; and
- Small, isolated populations **–** may lose genetic diversity and have a higher probability of extinction. It is unknown if a sufficient number of individuals exist to sustain the populations across the full range of environmental and demographic stochasticity (Vinkey 2003) (cumulative effect).

Stressors may cause loss of habitat, displacement, or mortality.

Environmental Consequences – Fisher

Effects Related to Key Stressors under Forest Service Control

Timber Harvest/Fire: Fishers evolved to use a habitat that tends to have stand-replacing disturbance due to the dense nature of the stands and large amount of fuels. The likelihood of a large, stand-replacing disturbance will be greater today due to fire suppression increasing stand densities and fuels, in particular on drier sites. Trending towards the desired conditions for vegetation will return stands nearer to historic conditions and enable them to be more sustainable and resilient to large-scale, stand replacing disturbance. This will improve and maintain fisher habitat in a distribution and amounts better approximating what would have been present under natural disturbance processes. There will be a lower likelihood of a stand-replacing event starting in the lower elevation, drier forests, and carrying into the moist forest types (fisher habitat).

Timber harvest designed to move toward the desired conditions for vegetation and historic conditions (FW-DC-VEG-01 through 09, FW-DC-VEG-11, and FW-DC-FIRE-03) will aid in maintaining fisher habitat in a sustainable and resilient condition. FW-DC-VEG-07 and 08, FW-GDL-VEG-03 through 06, FW-DC-WL-13 and 14 will retain snags and downed wood that are important to fishers in a distribution and quantity nearer to what will have been present under natural disturbance processes. Timber harvest may cause disturbance to fishers and lead them to at least temporarily avoid the areas adjacent to logging activities. FW-GDL-WL-25 will protect den sites with timing restrictions and distance buffers.

Fisher habitat was modeled by Ecosystem Research Group (ERG) in 2012 (ERG 2012). ERG modeled several scenarios for comparison purposes. Table 66 displays some of the relevant scenarios. The existing 1987 Forest Plan was modeled, as was a “no treatment” scenario, where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. A warmer/drier climate over the next five decades as the climate changes was considered. Scenarios also considered that the current level of fire suppression would continue into the future and considered an increase in acres burned over time due to a warmer/drier climate and fuel loads. Over the next five decades wildfire and root disease are the expected causes of the decline in fisher habitat availability. Even though habitat declines, it remains within HRV for the alternatives and there is no indication that fisher viability is at risk (page 85 in ERG 2012). The other alternatives are similar to Alternative B Modified.

Table 66. Acres of Fisher Habitat

Decade	Alternative B Modified	1987 Forest Plan (acres)	No Treatment Scenario (acres)
0	1,156,387	1,156,387	1,156,387
1	882,433	857,677	862,631
2	803,708	772,544	761,735
5	785,040	755,169	739,428

Source: Ecosystem Research Group (2012). Scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

For fisher, as with wildlife on the Forest in general, it is wildfire, insects/disease, in-growth, and stand succession that largely determines the amount and pattern of habitat on the Forest for this species rather than management activities (pages ES-1 and ES-2 in ERG 2012).

Mehl et al. (2009) developed a report for the Idaho Department of Lands (IDL) that examined IDL's goal of restoring/maintaining a 20 percent representation of historic habitat conditions on their lands in north Idaho. They assumed that the same 20 percent would be met on other land ownerships as well. For fisher, restoring/maintaining 20 percent representation of historic habitat conditions for native species maintain sufficient habitat (page 210 in Mehl et al. 2009). Habitat connectivity for fisher would not be limited under such a scenario (page 211 in Mehl et al. 2009). They stated that the objectives are not to return the entire landscape to historic conditions, but to provide sufficient amounts of similar ecosystems represented across the landscape to maintain native species (page 43 in Mehl et al. 2009). The revised Forest Plan for the IPNF does far more than aim to restore/maintain only 20 percent of historic habitat conditions for native species. The desired conditions for vegetation in the revised Forest Plan are based on historic conditions and natural disturbance processes rather than aiming for a lower percentage of representation of historic habitats.

Cumulative Effects

Please see the "Cumulative Effects Common to Most Species" section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the "Cumulative Effects Common to Most Species" section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past timber harvest, fuels reduction, and fire suppression have intermixed to result in the amount and pattern of fisher habitat on NFS lands. Overall, the amount of habitat on the Forest is above HRV (pages 84-85 in ERG (2012). Some disturbance may have occurred to individual fishers during project activities or by recreational activities.

Timber management is likely to continue on non-NFS ownerships. If done in moist forest types with dense canopies, then fisher habitat may be altered. Snags and downed wood may be reduced, particularly on private lands. The focus on private lands may not be on restoration, historic conditions, and creating resilient stands, but on monetary factors.

Climate change is likely to alter the distribution and extent of fisher habitat. A warmer climate will reduce the extent of dense, closed canopy forest. Those stands will be more susceptible to large-scale, stand replacing disturbance like fire or insects. Both may at least temporarily increase the amount of snags and downed wood until the next fire, but there will be an open canopy and the stands will not be suitable for fisher. Distributional shifts are one way species respond to climate change (page 90 in USDA Forest Service 2010).

Trapping mortality, both legal and incidental (marten trapping), can contribute to population declines or prevent a population from increasing.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for fisher. The determination is based in part on:

- Both snags and the large/very large size class increase under all alternatives;
- FW-DC-VEG-07 and 08, FW-GDL-VEG-03 through 06, FW-DC-WL-13 and 14 will retain snags and downed wood that are important to fishers;
- A trend towards historic conditions and the desired conditions for vegetation (FW-DC-VEG-01 through 09, FW-DC-VEG-11, and FW-DC-FIRE-03) will change the distribution and amount of fisher habitat nearer to what will have been present under natural disturbance processes;
- Even though habitat declines, it remains within HRV for the alternatives and there’s no indication that fisher viability is at risk (page 85 in ERG 2012). The decline is driven by root disease and fire; and
- Geographic Area direction that improves or maintains connectivity includes: GA-DC-WL-CDA-03, GA-DC-WL-LK-01 and 02, GA-DC-WL-PO-01, GA-DC-WL-PR-01 and 03, and GA-DC-WL-SJ-02. Additionally, FW-DC-WL-18, and FW-GDL-WL-15 through 17 also maintain connectivity.

Flammulated owl – Otus flammeolus

Affected Environment

Flammulated owl population biology, ecology, habitat description, and relationships identified by research are described in the birds of North America Online (McCallum 1994), Groves et al. (1997b), Hayward and Verner (1994) and Samson (2006a, 2006b) and incorporated by reference. Additional information is provided in the Montana Natural Heritage Program (MNHP), Idaho Data Conservation Center and NatureServe databases and in COSEWIC (2001). Formal surveys were conducted throughout the region, including the Forest, by the Avian Science Center

(Smucker and Cilimburg 2008) and for several years by Forest representatives using protocol developed by the MNHP (included in the Forest files).

Samson (2006a) completed "A conservation assessment of the northern goshawk, black-backed woodpecker, flammulated owl, and pileated woodpecker in the Northern Region, USDA Forest Service" and estimated the amount and distribution of flammulated owl habitat in Region One and for each of the Northern Region National Forests. Samson (2006b) also developed habitat estimates for maintaining viable populations of flammulated owl in Region One. Bush and Lundberg (2008) provided an update of habitat estimates for the Region One Conservation Assessment.

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes). The ERG analysis (ERG 2012) looked at vegetation changes over the next 50 years.

Habitat and Life History Needs

McCallum (1994) and Hayward and Verner (1994) provide substantive reviews of flammulated owl habitat, behavior, and general ecology. Breeding habitat is primarily ponderosa pine or forest with similar characteristics (i.e., dry montane coniferous forest or aspen forests, with brushy understory or open grasslands nearby). The preferred breeding habitat hosts a high diversity or abundance of nocturnal arthropods (mainly insects). Prey availability appears to be the primary factor for migration and patterns in migration and winter habitat requirements are poorly known.

Wisdom et al. (2000) identify source habitats as late-seral multi- and single-layered stages of the montane community group. Source habitats also include unmanaged young forests that contain sufficient large diameter snags and logs needed for various life functions for the species. Late-successional forests of ponderosa pine and Douglas-fir seem to be the key components of flammulated owl home ranges (Reynolds and Linkhart 1992 cited in Wisdom et al. 2000). Variability in the structure of these late-successional stands seems important to support life functions of flammulated owls. Roosting occurs in fairly dense stands, whereas relatively open stands seem to be selected for foraging (Linkhart 1984 cited in Wisdom et al. 2000) and open mature stands are selected for nest sites (McCallum 1994). Flammulated owls nest in cavities in both snags and large live trees, (Bull et al. 1990 cited in Wisdom et al. 2000). Flammulated owls have been known to nest in cavities excavated by pileated woodpeckers (Aubry and Raley, 2002). In two Oregon studies mean dbh of nest trees were 22.2 inches (Goggans 1986) and 28.4 inches (Bull et al. 1990) both cited in Wisdom et al. (2000).

Nesting and foraging habitat for this species has been identified as mature to late-successional ponderosa pine/Douglas-fir stands. Within these stands this owl nests in cavities excavated by woodpeckers, especially larger woodpeckers such as the pileated woodpecker. Mature ponderosa pine stands also serve as foraging habitat. The stands support high numbers of prey (insects) and their open nature is compatible with the owl's hunting strategy of capturing insects in flight. Roosting habitat or areas where individual flammulated owls spend the day resting, has been identified as dense, mixed conifer stands (Ibid).

Habitat Estimates

Estimates of the amount of habitat currently available for the flammulated owl (Bush and Lundberg 2008) in the northern region (Samson 2006a), show that habitat is abundant and well distributed across the Northern Region by Ecological Province and National Forest. Habitat estimates for the Northern Region, the Northern Rocky Mountain Ecological Province (which includes the Forest) are displayed in table 67 (Bush and Lundberg 2008).

Table 67. Estimated Habitat for Flammulated Owl (acres)

	Region One	Northern Rocky Mountain Ecological Province
Habitat	184,952	105,290

Flammulated owl habitat was modeled by Ecosystem Research Group (ERG) in 2012 (ERG 2012). ERG modeled several scenarios for comparison purposes. Table 68 displays two of the relevant scenarios. The existing 1987 Forest Plan was modeled, as was a "no treatment" scenario, where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. Both consider a warmer/drier climate over the next five decades as the climate changes. Both of these scenarios also considered that the current level of fire suppression would continue into the future and both considered an increase in acres burned over time due to a warmer/drier climate and fuel loads.

Table 68. Acres of Flammulated Owl Habitat

Decade	1987 Forest Plan		No Treatment Scenario	
	Actual Habitat	Potential Habitat	Actual Habitat	Potential Habitat
0	22,286	41,017	22,286	41,017
1	18,161	48,978	18,412	51,942
2	9,258	63,052	8,825	71,350
5	12,950	69,567	11,573	69,701

Source: Ecosystem Research Group (2012). Both scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

"Actual" habitat are those acres expected to exist at a particular point in time. "Potential" habitat is those acres that do not quite meet all the criteria of being habitat at a particular point in time, but are on the trajectory to become "actual" habitat

Habitat Threshold

Samson (2006a) in his conservation assessment estimated the critical habitat threshold for a minimum viable population of flammulated owls for the Northern Region. For his assessment Samson estimated that the amount of habitat needed for a minimum viable population of flammulated owls is 4,700 acres (approximately 19 mi2). Based on the estimate of the current amount of habitat available (Bush and Lundberg 2008) displayed in the table 67above, the Northern Region provides more than enough habitat to support a minimum viable population of flammulated owls. In fact, habitat estimates (Bush and Lundberg 2008) for the Northern Rocky Mountain Ecological Province and for 11 of the 12 National Forests in the Northern Region (including the Idaho Panhandle) exceed that required to support a minimum viable population of flammulated owls.

Large Size Class/Late-Successional Forest

Wisdom et al. (2000) identified that there has been a strong decline in source habitats throughout the Interior Columbia Basin for species dependent on late-successional forest habitats present over broad elevations which include the flammulated owl. Analysis of late-successional and/or the large size class on the Forest (see vegetation write-up in this EIS) has also identified that there has been a fairly significant reduction in the amount of late-successional forests and stands in the large size class. However, late-successional forests are still considered to be well distributed across the Forest. In addition to current late-successional stands, the Forest is managing additional lands for their late-successional forest characteristics, such as large trees. The current trend is such that late-successional forests are no longer targeted for timber harvest and there is an increase in the number of large diameter trees retained in areas of vegetation management. Over the short- and long-term natural vegetation succession will result in an increase in the amount of lands in the large size class and subsequently in the amount of late-successional forest components, such as snags, and down wood important for these species.

Snags

A snag analysis recently conducted for the Forest (Bollenbacher et al. 2009) provides an estimate of the number of snags currently existing throughout the forested portion of the Forest. The analysis compared the amount of snags in wilderness/roadless areas versus those outside wilderness/roadless areas. The analysis identified that areas outside of wilderness/roadless areas have fewer snags per acre than those in wilderness/roadless areas. The snag densities within wilderness/roadless areas provide insight into natural snag abundance and distribution, and this can be compared to areas outside of wilderness/roadless (page 4 in Bollenbacher et al. 2009). Although there are fewer snags outside of wilderness/roadless areas, the 90 percent confidence intervals for wilderness/roadless area snags overlaps the mean snags/acre for all but the 15”+ dbh in areas outside of wilderness/roadless (table 2 in Bollenbacher et al. 2009). In other words, the number of snags outside of wilderness/roadless areas, which represents natural snag abundance, is not very different than the number of snags outside of wilderness/roadless. Please see the snag discussion in the “Vegetation” section of the FEIS and DEIS (pages 65-68 in the DEIS) for more information regarding the findings of Bollenbacher et al. 2009 and the amount of snags available on the Forest.

It appears very likely that the flammulated owl distribution has not contracted in North America (McCallum 1994). Available evidence, all of which is circumstantial, suggests that the North American distribution of the species has not changed since the first specimen was obtained in 1860 (Ibid). Habitat loss from logging, fire suppression, and type conversions make it likely that owl numbers have decreased in the last century; however, there is no reliable evidence that the flammulated owl abundance has changed anywhere in North America (Ibid). Loss of winter habitat, presumably in southern Mexico, through logging, adds to the likelihood that owl numbers have decreased. The bottom line is that it is not known whether flammulated owl populations are secure or declining, but the species currently occupies all of its known range in what appears to be good numbers (Ibid).

Habitat for the flammulated owl has and will continue to decline due in part to fire suppression (PIF 2000). Virtually every author working with the flammulated owl suggests fire suppression has been a negative influence on habitat (Ibid). Fire suppression permits young Douglas-fir trees to suppress the recruitment of shade intolerant and large diameter trees important to the flammulated owl and to reduce the amount of open understory needed by the owl as foraging areas. Whether enough fire can be introduced is unknown, and mechanical removal of understory may serve as an effective alternative to fire (Ibid).

Key Stressors

Stressors outside Forest Service control include:

- The private development of montane forests;

- Avian predators (great horned owl, northern goshawk, coopers hawk);
- Loss of dry conifer forests on wintering grounds;
- Threats associated with migration and while in wintering habitat; and
- Decline in riparian habitats.

The following Forest Service management activities may have direct or indirect effects on snags and cavity habitat. (McCallum 1994, Groves et al. 1997b cited in IDFG 2005):

- Fire (both planned ignitions and natural, unplanned ignitions) – removal of standing snags and down wood or direct mortality;
- Road maintenance and construction – habitat loss and loss/reduction in secure habitat;
- Recreational use – habitat loss or disturbance during use in sensitive habitats;
- Fire suppression – the main effect has been to decrease ponderosa pine regeneration (decreased breeding habitat for owls) but increase Douglas-fir thickets (which provide security cover from predators);
- Human disturbance – during breeding, nesting and rearing periods (Taylor and Knight 2003) (May through July);
- Selective cutting trees – for firewood can alter breeding habitat structure and have adverse effects on nesting owls, especially between May and August when nest trees may be removed;
- Loss of mature and late-successional dry pine forest and the reduced numbers of snags, particularly large snags;
- Decline in late-successional forests of cottonwood and aspen;
- Decline in availability of large snags and trees for foraging and nesting;
- Any action that removes deciduous trees and snags from riparian areas and aspen stands;
- Declines in shrub understories of montane and lower montane forests;
- Fragmentation of late-successional forest habitat;
- Loss of down wood;
- Use of herbicides and pesticides in forests may negatively affect non-target species such as moths on which flammulated owls and Lewis's woodpecker depend for food;
- Selective timber harvesting with subsequent replanting of closely spaced seedlings; and
- Intensive grazing that may remove the shrub and grass understory.

These stressors may result in habitat loss, displacement, nest failure, or mortality.

Environmental Consequences – Flammulated Owl

Effects Related to Key Stressors under Forest Service Control

Fire/Vegetation Management: Fire suppression has reduced habitat quality for flammulated owls. It has increased encroachment by shade-tolerant conifers, created a dense understory and eliminated foraging habitat, and retarded the development of large ponderosa pine that are useful for large snags and nesting cavities. The increase in fuels puts the existing large ponderosa pine at an increased risk of being lost in a stand-replacing event. Alternative A will be more likely to continue the active suppression of most fires. The action alternatives have more flexibility to use fire to restore/maintain habitat.

Fuels reduction, in particular when done to trend towards the desired conditions for vegetation (FW-DC-VEG-01 through 08, FW-DC-VEG-11, and FW-DC-FIRE-03), will improve or maintain flammulated owl habitat. Expanded use of natural, unplanned ignitions through FW-DC-FIRE-03 will be useful for maintaining and improving flammulated owl habitat.

FW-STD-VEG-01, FW-GDL-VEG-01 and 02, FW-GDL-VEG-04 and FW-GDL-VEG-05, FW-DC-WL-10, FW-DC-WL-11, FW-DC-WL-12, FW-DC-WL-13 move habitat conditions towards historic conditions, make stands more resilient to disturbance, and maintain or improve snag habitat.

By moving towards the desired conditions for vegetation, the amount and distribution of flammulated owl habitat will approximate what would have been present under natural disturbance processes. Drier forests, which are the most likely to be outside of historic conditions due to fire suppression, will be more resilient to large-scale disturbance.

Flammulated owl habitat was modeled by Ecosystem Research Group (ERG) in 2012 (ERG 2012). ERG modeled several scenarios for comparison purposes. Table 69 displays some of the relevant scenarios. The existing 1987 Forest Plan was modeled, as was a “no treatment” scenario where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. Scenarios consider a warmer/drier climate over the next five decades as the climate changes. These scenarios also considered that the current level of fire suppression would continue into the future and both considered an increase in acres burned over time due to a warmer/drier climate and fuel loads. There is an increase in the amount of actual and potential flammulated owl habitat over time under all the alternatives. Potential habitat is within HRV and remains there over the next five decades, although at the low end of the range of variability. The model may have difficulty predicting open forest conditions used by flammulated owls due to low/moderate severity wildfires and/or treatments. The model may not provide enough activities in the low elevation, dry forest habitats to restore historic stand structures. With the predicted increase in low/moderate severity wildfires, the improvement in suitable habitat should have been more pronounced; therefore the level of certainty for the predicted outcomes is likely low (page 87 in ERG 2012). The increase in low/moderate severity fire and forest growth increases the amount large/very large trees over time. This is seen in the increase in “potential” habitat over time. However, the smaller increase in suitable habitat suggests that the increase in large trees is accompanied by dense stand structures that do not provide the best flammulated owl habitat (page 86 in ERG 2012).

Flammulated owl habitat may be restored or improved to a greater degree if more treatments are focused on the potential flammulated owl habitat in order to open up the stands. The revised Forest Plan provides the flexibility to do this kind of work.

Table 69. Acres of Flammulated Owl Habitat

Decade	Alternative B Modified		1987 Forest Plan		No Treatment Scenario	
	Actual Habitat	Potential Habitat	Actual Habitat	Potential Habitat	Actual Habitat	Potential Habitat
0	22,286	41,017	22,286	41,017	22,286	41,017
1	16,423	47,003	18,161	48,978	18,412	51,942
2	7,840	57,970	9,258	63,052	8,825	71,350
5	11,890	59,984	12,950	69,567	11,573	69,701

Source: Ecosystem Research Group (2012). Scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

”Actual” habitat are those acres expected to exist at a particular point in time. “Potential” habitat is those acres that do not quite meet all the criteria of being habitat at a particular point in time, but are on the trajectory to become “actual” habitat

For flammulated owl, as with wildlife on the Forest in general, it is wildfire, insects/disease, in-growth, and stand succession that largely determines the amount and pattern of habitat on the Forest for this species rather than management activities (pages ES-1 and ES-2 in ERG 2012).

Mehl et al. (2009) developed a report for the Idaho Department of Lands (IDL) that examined IDL's goal of restoring/maintaining a 20 percent representation of historic habitat conditions on their lands in north Idaho. They assumed that the same 20 percent would be met on other land ownerships as well. For flammulated owl, restoring/maintaining 20 percent representation of historic habitat conditions for native species would substantially increase habitat (page 211 in Mehl et al. 2009). They stated that the objectives are not to return the entire landscape to historic conditions, but to provide sufficient amounts of similar ecosystems represented across the landscape to maintain native species (page 43 in Mehl et al. 2009). The revised Forest Plan for the IPNF does far more than aim to restore/maintain only 20 percent of historic habitat conditions for native species. The desired conditions for vegetation in the revised Forest Plan are based on historic conditions and natural disturbance processes rather than aiming for a lower percentage of representation of historic habitats.

Under current management (Alternative A), the percentage of the Forest with high snag densities will increase over the next five decades. The percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 78 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 11 percent in decade 1 to 35 percent in decade 5 with an unconstrained budget and 11 percent to 36 percent with constrained budgets.

For Alternative B Modified, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 81 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 12 percent in decade 1 to 36 percent in decade 5 with an unconstrained budget and 12 percent to 37 percent with constrained budgets.

For Alternative C, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 76 percent in decade 5 with an unconstrained budget and 73 percent to 83 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 12 percent in decade 1 to 37 percent in decade 5 with an unconstrained budget and 12 percent to 39 percent with constrained budgets.

For Alternative D, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will remain steady from approximately 73 percent in decade 1 to 73 percent in decade 5 with an unconstrained budget and increase from 73 percent to 80 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 11 percent in decade 1 to 34 percent in decade 5 with an unconstrained budget and 11 percent to 37 percent with constrained budgets.

Direction in the revised Forest Plan that maintains snag habitat includes: FW-DC-VEG-07, FW-GDL-VEG-04 and 05, and FW-DC-WL-13.

Several variables determine the amount of flammulated owl habitat across the Forest. Fire, fire suppression, climate change, and vegetation management combine and contribute to the availability of habitat. The revised Forest Plan will move vegetation conditions towards a desired condition that will be based on historic conditions (FW-DC-VEG-01 through 08, FW-DC-VEG-11, and FW-DC-FIRE-03). The distribution and amount of flammulated owl habitat should be nearer historic levels if natural disturbance processes are allowed to function, particularly fire (FW-DC-FIRE-03).

The difference between the alternatives will be primarily how much vegetation treatment will be predicted each year to trend conditions toward the desired conditions for vegetation. Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year). Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives, with 6,000 acres/year of prescribed burning in Alternative A. Of the alternatives, B Modified (1,683 acres) will be expected to have more regeneration treatments per year with constrained budgets in the first decade, followed by C (1,677 acres), D (1,609 acres), and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) will be expected to have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and A (5,537 acres).

Given the predicted amounts of harvest, active restoration will have little impact on habitat pattern at the Forest scale compared to the potential impacts of fire use. The use of natural, unplanned ignitions (passive restoration) will have a much greater likelihood of maintaining or improving habitat pattern across the Forest. Alternative A (current Forest Plan as implemented) will be more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire for habitat restoration/maintenance. Under the action alternatives, FW-DC-FIRE-03 will be the most useful component in the revised Forest Plan for improving flammulated owl habitat. FW-DC-FIRE-03 reads, "The use of wildland fire (both planned and natural, unplanned ignitions), increases in many areas across the Forest. Fire plays an increased role in helping to trend the vegetation towards the desired conditions while serving other important ecosystem functions. However, when necessary to protect life, property, and key resources many wildfires are still suppressed."

The large/very large size class is currently below desired conditions (historic conditions) for stands on the Forest. With unconstrained budgets, there will be an increase in acres in this size class in the next 50 years for Alternatives B Modified (+54,243 acres), C (+51,566 acres) and D (+34,730 acres). Alternative A would decline (-10,836 acres). With constrained budgets, there will be an increase in acres in this size class in the next 50 years for Alternatives C (+109,175 acres), B Modified (+102,149 acres), D (+105,372 acres) and A (+83,235 acres). The large/very large size class would remain within HRV.

This means that flammulated owls will find an increase of stands in the large/very large size class and an abundance of snags under all alternatives in the next 50 years.

Access/Disturbance: Alternative C (2,129,490 acres motorized) will have the least acreage allowing motorized use, followed by Alternatives B Modified (2,268,390 acres motor vehicle use), D (2,279,590 acres motor vehicle use) and A (2,399,138 acres motor vehicle use).

Open roads facilitate access for firewood cutters, and the loss of snags near roads can reduce the availability of habitat. Flammulated owls use cavities in large snags for nesting, so it is likely that the quality of habitat near roads will be less than elsewhere due to the relative lack of snags. Recreation can disturb individuals and cause them to temporarily avoid an area, and human presence tends to be highest near roads.

FW-GDL-WL-20 and FW-DC-WL-01 will reduce or eliminate the chance of disturbance to flammulated owls. Timber sales/fuels reduction activities can cause disturbance to flammulated owls. Individual special use permits may have disturbance effects, but generally will have a small footprint and cause little or no loss of habitat.

The effects of any potential minerals development within flammulated owl habitat will depend on the footprint of the mine, as well as whether it was an above-ground or below-ground mine. Mining activities and the haul/supply route may contribute to disturbance of flammulated owls. Disturbance may result in owls utilizing other area of the Forest.

The collection of forest products may cause disturbance, but most of that disturbance will be concentrated near open roads.

Impacts on Invertebrate Prey: Grazing can reduce the amount of grasses and shrubs in the understory and consequently reduce the quality of foraging habitat for flammulated owls. Changes in the understory impact the abundance and species presence of arthropods that form the prey base for flammulated owls. Current grazing will continue under Alternative A. Under the action alternatives, FW-DC-GRZ-01 states that grazing will occur at sustainable levels while protecting vulnerable resources such as wildlife habitat. That desired condition, along with FW-DC-WL-10, will maintain habitat for flammulated owls. Therefore, the grazing effects to flammulated owls and other wildlife should be limited.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past timber harvest, fuels reduction, and fire suppression have changed the pattern and availability of flammulated owl habitat on NFS lands. Fire suppression in particular is likely to have had an impact on suitable flammulated owl habitat by leading to an increase in tree density in formerly open-canopied stands. Potential habitat on the Forest is currently within HRV (page 87 in ERG 2012). Firewood harvest near open roads may have reduced the availability of large snags for nesting.

Timber management is likely to continue on non NFS ownerships. Their effects would depend on how many snags are retained, whether dry forest habitat that is outside of historic conditions is restored, whether large trees are maintained, and the amount of disturbance to individual flammulated owls. The development of private land may also lead to habitat loss and disturbance.

If the climate becomes warmer, it will favor the vegetation conditions that flammulated owls prefer (open, ponderosa pine or dry forest habitats). Unfortunately, fire suppression has led to increased stand densities and ladder fuels. Those stands that contain larger ponderosa pine may be at a higher risk of stand replacing disturbance (fire/insects) which will reduce flammulated owl habitat. Active restoration may be useful to move towards the desired conditions for vegetation and historic conditions, making these stands more resilient and able to handle disturbance. The use of fire for restoration will be the most useful tool rather than mechanical treatments due to the large acreages that can be improved or maintained with fire relatively cheaply. Changes in the timing of prey availability may also affect flammulated owls (page 90 in USDA Forest Service 1990).

Declines in riparian habitat, threats to wintering ground habitat, and mortality while migrating or on wintering grounds can all lead to declines in the flammulated owl population. Avian predators on winter and summer ranges can also cause population declines or limit population increases.

Grazing will continue on other ownerships, and if it reduces the availability of grasses and shrubs there may be a reduction in flammulated owl foraging habitat.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for flammulated owl. This determination is based in part on:

- Under the revised Forest Plan, snag densities and the amount of the Forest in a large tree size class will increase over the next 50 years;
- Direction in the revised Forest Plan that maintains snag habitat includes: FW-DC-VEG-07, FW-GDL-VEG-04 and 05, and FW-DC-WL-13;
- The action alternatives have more flexibility to use fire for habitat restoration/maintenance; and
- There is an increase in the amount of actual and potential flammulated owl habitat over time under all the alternatives (page 87 in ERG 2012).

Gray Wolf – Canis lupus

Affected Environment – Gray Wolf

Gray wolf population biology, ecology, habitat description, and relationships identified by research are described in USDI Fish and Wildlife Service et al. (2009), USDI Fish and Wildlife Service (2009b), Idaho Wolf Legislative Oversight Committee’s Idaho wolf conservation management plan (2002),and the Montana Gray Wolf Conservation and Management Plan (2004) and incorporated by reference. Additional information is included in the Montana Natural Heritage Program (MNHP and MFWP 2011); and NatureServe databases (2011). Information on wolf numbers are described in Sime et al. (2011) for the State of Montana and Mack et al. (2010) for the state of Idaho, including information for the Forests, based on annual monitoring.

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Habitat and Life History Needs

Wolves prey primarily on elk, deer, and moose. Domestic livestock such as cattle and sheep are also preyed upon. Wolves may also eat alternative prey, such as rodents, vegetation, and carrion. Wolves commonly hunt in packs, but lone wolves and pairs are able to kill prey as large as adult moose (MNHP and MFWP 2011). Wolf packs are family groups that consist of a breeding pair and their offspring of the current year and/or previous years and occasionally unrelated wolves. Offspring usually disperse from the natal pack at 1, 2, or 3 years of age.

The gray wolf exhibits no particular habitat preference except for the presence of native ungulates within its territory on a year-round basis. Pack activity is centered on the den site and nearby rendezvous sites from late April until September (MFWP 2003). Pack territories are dynamic and change from year to year depending on prey availability, wolf populations, and relationships with neighboring packs (MNHP and MFWP 2011). Idaho wolf pack territories average around 200 square miles in size and can be 300 square miles or larger. Dispersal distances in the Northern Rockies average about 60 miles, but dispersals over 500 linear miles have been documented (Mack et al. 2010).

As the number of wolves has increased, so have the number of depredations and the number of wolves removed as a result. In Montana a total of 727 wolves have been killed from 1987-2010 to help resolve conflicts with livestock (Sime et al. 2011). In Idaho, from 1995 to 2010, 462 wolves were controlled for livestock depredations (Sime et al. 2011).

Key Stressors

Forest Service activities in the past that may have had direct or indirect impacts on wolves, causing displacement or mortality, include:

- Factors that affect habitat conditions for big game including timber harvest, prescribed fire, and fire suppression;
- Human access to dens and rendezvous sites during critical life history periods may result in abandonment of dens and/or young; and
- Road access.

Stressors outside Forest Service control that may cause displacement or mortality include (cumulative effects):

- Potential spread of diseases such as canine distemper virus, canine parvovirus, and others;
- Vehicle caused mortality;
- Persecution;
- Private development of wildlands;
- Factors affecting big game populations such as hunting, the spread of invasive plant species (weeds) that reduce forage values and habitat capacity for prey species, and major weather events that can contribute to high ungulate mortality;
- Connectivity loss could be a problem where urban areas or transportation corridors act as barriers;
- Illegal mortality;
- Legal mortality as a result of depredation concerns; and
- Legal mortality as a result of delisting and state public hunting strategies.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Ungulate Habitat: Big game habitat is managed under the1987 Plan (Alternative A). Under the action alternatives, FW-DC-WL-09 states that wolves will find an abundance of big game for prey. FW-DC-WL-17 states that ungulate habitat will be managed in coordination with state agencies, but that cover will be managed according to the desired conditions for vegetation (FW-DC-VEG-01 and 02, FW-DC-VEG-04 and 05, and FW-DC-VEG-11). Fire will be desired to play a more natural role in the ecosystem through implementation of FW-DC-FIRE-03. Doing so will restore/maintain the vegetation component of ungulate habitat to what would have been present under natural disturbance processes. Those are the conditions that native ungulates evolved with, and therefore what wolves evolved with in these ecosystems. Disturbance to ungulates on winter range would be minimized through FW-GDL-WL-11 and 12, and disturbance in during the birthing period would be minimized by FW-GDL-WL-14. Security habitat for ungulates would be provided through FW-DC-WL-02, FW-DC-WL-04 and 05, FW-DC-WL-09, FW-STD-WL-02, MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, MA5-DC-WL-01, GA-DC-WL-CDA-02, and GA-DC-WL-SJ-01.

Fire and fuels can have a tremendous effect on ungulate habitat. Past fire suppression and past timber harvest practices have combined to push vegetation conditions outside of historic conditions. This has altered the amount, distribution, and quality of ungulate habitat on the IPNF. Combined with future climate change, insects, and disease, it is likely that ungulate habitat will be further altered if conditions remain on their current trajectory. Vegetation management under current management is less likely to be influenced by historic conditions than the action alternatives. Additionally, there is less emphasis on utilizing natural, unplanned ignitions under current management compared to the action alternatives, and there is less predicted prescribed fire that will help maintain or restore big game habitat. Alternative A is predicted to mechanically treat approximately 4,867 ac/yr (constrained budget), or 5,537 acres/year (unconstrained budget) and have 6,000 acres/year prescribed fire. More unplanned ignitions are expected to be actively suppressed compared to the action alternatives.

However, active restoration efforts to move towards historic conditions and the desired conditions for vegetation (FW-DC-VEG-01 and 02, FW-DC-VEG-04 and 05, and FW-DC-VEG-11) will make ungulate habitat more sustainable and resilient to large-scale disturbance under the action alternatives. Large-scale disturbance will create large patches of homogenous habitat. Moving towards the desired conditions for vegetation will maintain better habitat diversity and heterogeneity. Alternative C (11,031 acres/year) will have the most predicted active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most predicted active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year). Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives, with 6,000 acres/year of prescribed burning in Alternative A. Of the alternatives, B Modified (1,683 acres) will be expected to have more regeneration treatments per year with constrained budgets in the first decade, followed by C (1,677 acres), D (1,609 acres), and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) will be expected to have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and A (5,537 acres).

Pattern (size and arrangement of habitat patches) will be addressed through the desired conditions for vegetation (FW-DC-VEG-05). It is also affected by other direction for vegetation and fire (FW-DC-VEG-01 through FW-DC-VEG-04, FW-DC-VEG-08, FW-DC-VEG-11, FW-GDL-VEG-03, and FW-DC-FIRE-03). The desired conditions are based on historic conditions and natural disturbance processes, which mean the pattern of wolf/big game habitat across the Forest, will be similar to what would have been present under natural disturbance processes. This is even more likely if FW-DC-FIRE-03 is implemented. Given the predicted amounts of harvest, active restoration will have little impact on habitat pattern at the Forest scale compared to the potential impacts of fire use. The use of natural, unplanned ignitions (passive restoration) will have a much greater likelihood of maintaining or improving habitat pattern across the Forest. Alternative A (current Forest Plan as implemented) will be more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire to restore/maintain habitat. The use of natural, unplanned ignitions (passive restoration) will be more likely in MA1, and Alternative C (335,300 acres) will have the most MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and A (153,900 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

Human Access/Roads: High road densities have been negatively linked to wolf survival or persistence in an area (Thiel 1985).

Current management protects known dens and rendezvous sites. Under the action alternatives,FW-DC-WL-09 states a desired condition that there would be a low level of disturbance around wolf dens and rendezvous sites, and FW-GDL-WL-22 sets timing restrictions and distance buffers around those sites. FW-DC-WL-02, FW-DC-WL-04 and 05, FW-DC-WL-09, FW-STD-WL-02, MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, MA5-DC-WL-01, GA-DC-WL-CDA-02, and GA-DC-WL-SJ-01 also reduce the possibility of disturbance around dens and rendezvous areas by creating security habitat with lower human presence due to lack of motorized access. Opportunistic poaching of wolves and harvesting wolves during hunting/trapping season may be more difficult due to the reduced road densities.

Alternative A will retain the existing amount of recommended wilderness and non-motorized areas. Alternative C (2,129,490 acres motorized, 1,598,067 acres over-snow motorized) would have the least acreage allowing motorized use, followed by Alternatives B Modified (2,268,390 acres motorized, 1,756,980 acres over-snow motorized), D (2,279,590 acres motorized, 1,759,738 acres over-snow motorized) and A (2,399,138 acres motorized, 1,970,537 acres over-snow motorized). Alternative C (335,300 acres) would have the most land in MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and Alternatives A (153,900 acres).

The Access Amendment reduced road densities in grizzly bear habitat (included by FW-STD-WL-02), benefiting not only grizzlies, but wolves as well. The Access Amendment applies to current management as well as the action alternatives. Opportunistic poaching of wolves may be more difficult due to the reduced road densities.

Recreation, both motorized and non-motorized, can disturb wolves or their prey and cause them to avoid an area. FW-DC-WL-02 states that a forestwide system of large remote areas will be available for species with large home ranges.

Cumulative Effects

Please see the "Cumulative Effects Common to Most Species" section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the "Cumulative Effects Common to Most Species" section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past timber harvest, fuels reduction, and fire suppression have likely altered the pattern and availability of ungulate habitat on NFS lands, and therefore the distribution and availability of prey for wolves. Fire suppression in particular may have altered the pattern and availability of forage habitat for ungulates due to increased tree density, the closure of formerly open-canopied stands, and the encroachment of conifers into natural openings. Access management has trended towards reducing the amount of open roads and therefore the opportunities for a human-wolf encounter on NFS lands. That decreases the possibility of disturbance to wolves and makes it more difficult for wolves to be killed by providing more security habitat.

All the action alternatives will contribute toward maintaining or improving wolf and ungulate habitat. Timber harvest occurring on private, state, or Canadian lands may impact the distribution, amount, and quality of wolf and ungulate habitat and may impact connectivity between NFS lands. The desired conditions for vegetation in the revised Forest Plan would maintain or improve connectivity for wolves on the IPNF.

The desired condition for connectivity FW-DC-WL-18, and FW-GDL-WL-15 through 17, in the revised Forest Plan will direct the IPNF to work with other agencies and landowners when highways are proposed to be constructed or reconstructed to incorporate crossing structures where needed. This should aid in minimizing the risk of vehicle collisions with wolves and other large wildlife. This will also aid in maintaining some connectivity between NFS lands as private lands are subdivided in the future. Not only is wolf habitat/connectivity impacted due to subdivision of private lands, but it reduces ungulate habitat, including winter range.

Grazing has occurred and will continue to take place on lands belonging to various entities, potentially diminishing the amount of forage available for native ungulates or displacing them. Human-wolf conflicts can occur when wolves prey upon livestock, sometimes leading to removal of individual wolves or packs.

Factors affecting big game populations such as hunting, the spread of invasive plant species (weeds) that reduce forage values and habitat capacity for prey species, and major weather events that can contribute to high ungulate mortality can reduce the availability of prey for wolves.

Wolves are habitat generalists, so the greatest effect on climate change on wolves would not be on the species directly, but on their prey species. A trend towards the desired conditions for vegetation (FW-DC-VEG-01 and 02, FW-DC-VEG-04 and 05, FW-DC-VEG-10 and 11) in the revised Forest Plan will make ungulate habitat more sustainable and resilient to disturbance than it is currently. The vegetation components are outside of historic conditions on the IPNF, making them more susceptible to large-scale disturbance (fire, insects, and disease). Winter range for ungulates has been lost or altered due to subdivisions and other human developments. As climates change, the winter range may shift, possibly higher in elevation away from human developments, and the timing of winter range use may shift as well (page 92 in USDA Forest Service 2010). The extent of the change and the extent of the effects (positive or negative) are hard to predict. Trending towards historic conditions will allow landscapes to be more resilient and sustainable in the face of climate change. Use of FW-DC-FIRE-03 to let fire play a more natural role in the ecosystem will improve habitat conditions for ungulates, restore/maintain it towards historic conditions, and increase its resilience.

In 2009, a wolf hunting season occurred, however a court decision in 2010 reinstated the ESA protections for the gray wolf. In 2011 wolves were delisted again and hunting/trapping is occurring. The currently expanding wolf population may see a decreased growth rate, or see a population decline (while still meeting recovery objectives). If the wolf population continues to meet recovery objectives, then wolves are likely to continue to be present to occupy habitat on the IPNF.

Wolves are also sometimes killed (legally) due to depredation problems. This form of mortality has not kept wolf populations from exceeding recovery goals.

Canine distemper, parvovirus, and other diseases have the potential to decrease or limit wolf populations.

Persecution of wolves due to some people's negative attitudes towards them can lead to illegal wolf mortality. FW-DC-WL-02, FW-DC-WL-04 and 05, FW-DC-WL-09, FW-STD-WL-02, MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, MA5-DC-WL-01, GA-DC-WL-CDA-02, and GA-DC-WL-SJ-01 can provide security habitat on NFS lands and lessen the chance of persecution of wolves on NFS lands and limits motorized access for hunting/trapping of wolves.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for gray wolf. The effects determination is based in part on:

- FW-DC-WL-09 states that wolves will find an abundance of big game for prey;
- Den/rendezvous sites will be protected through FW-DC-WL-01 and FW-GDL-WL-22;
- FW-DC-WL-02, FW-DC-WL-04 and 05, FW-DC-WL-09, FW-STD-WL-02, MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, MA5-DC-WL-01, GA-DC-WL-CDA-02, and GA-DC-WL-SJ-01 also reduce the possibility of disturbance around dens and rendezvous areas by creating security habitat with lower human presence due to lack of motorized access. These would also provide security for big game; and
- Vegetation conditions (FW-DC-VEG-01 through FW-DC-VEG-05, FW-DC-VEG-08, FW-DC-VEG-11, FW-GDL-VEG-03, and FW-DC-FIRE-03), under all action alternatives, will be maintained or improved for wolves and their prey in the long-term.

Harlequin duck – Histrionicus histrionicus

Affected Environment

Harlequin duck population biology, ecology, habitat description, and relationships identified by research are described in Cassirer et al. (1996), Carlson (2004), Hendricks and Reichel (1998) and USDI Fish and Wildlife Service (1998) and incorporated by reference. Sources of ecological and occurrence information is available from state agencies such as Montana and Idaho Partners in Flight, and federal agencies that have developed shorebird and waterbird conservation plans. Observation data and use information for the Forest is based on formal surveys conducted periodically throughout the Forest.

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan.

Habitat and Life History Needs

Harlequin ducks use clear, fast-flowing rivers and streams for breeding; diving to river bottoms to pick larval insects from rocky substrates. After breeding, individuals migrate to the coasts of North American and Greenland. Four habitat characteristics were noted at more than 50 percent of harlequin duck observations in the Tetons (Wallen 1987 as cited in MFWP 2005): 1) streamside perennial shrub vegetation; 2) meandering (braided) channel types; 3) more than three loafing sites/10 m; and 4) areas unused by humans. Harlequins prefer stream size of second order or greater, stream gradients between 1 percent and 7 percent, and some areas of shallow water (riffles) (PIF 2000). They also prefer clear water, with gravel to boulder size substrate. Harlequins feed primarily on crustaceans, mollusks, insects, and a few small fishes (NatureServe 2011).

Suitable habitat, although uncommon, is fairly well distributed across the Forest. In many instances the confluence of these streams with the major river systems are situated on private lands and have been developed. In the 1970s and early 1980s large wood was removed from many of the streams on the Forest, which may have been a factor in use by harlequin ducks. However, large wood has been put back into many of those streams either as a result of restoration or from natural events. Overall, habitat for harlequin ducks has not changed significantly on NFS lands on the Forest.

Key Stressors

These stressors can lead to habitat loss or degradation, disturbance, nest abandonment, or even mortality.

Potential risks and threats to harlequin ducks considered to be outside Forest control (cumulative effects):

- Harlequins are present on the Forest only during the nesting and brood rearing seasons, then migrate to the coasts of Washington and Oregon to winter. A change in population may not represent changes in habitat conditions on the Forest but may be influenced by activities off Forest, particularly in wintering areas (NatureServe 2011);
- Demographic models have suggested that harlequin duck population growth rates are most sensitive to changes in adult survival (Goudie et al. 1994 cited in Carlson 2004). The most easily managed threat that directly affects adult survival is hunting (Carlson 2004);
- Another major factor that directly affects the survival of adult harlequins is oil pollution (Ibid);
- Nest predation can lead to population declines or hinder population increases;
- Heavy metal poisoning can cause harlequin mortality; and

- Illegal shooting and trapping can cause harlequin mortality.

Potential risks and threats to harlequin ducks from activities on NFS lands (indirect effects):

- Loss or degradation of habitat – Activities that result in streambank or channel alteration that eliminates or reduces cover and food supply (PIF 2000, NatureServe 2011, and Carlson 2004). These include channelization, damming, livestock grazing, brush removal, timber harvest, gravel extraction, logjam removal, dredging, bank rip-rap, and road construction (PIF 2000);
- Disturbance at the nest site or of nesting colonies – Human activity, either instream or on the bank may displace birds and indirectly impact reproduction. Activities include boating use, angler use, hiking, camping, and land management activities in and along streams during the breeding season (PIF 2000, Spahr et al. 1991, NatureServe 2011, (Carlson 2004);
- Water level fluctuation – High water during nesting and brood rearing can reduce or eliminate productivity. Low water will render feeding and brood rearing habitats unavailable. These activities include hydropower development, stream diversion or damming, timber harvest and road construction (PIF 2000, NatureServe 2011, PIF 2000, Carlson 2004) and
- Wetland contamination/pesticide reduction of favored insect foods – Sedimentation and toxic chemical pollution may reduce the supply of macroinvertebrates or reduce the ducks ability to find prey. These activities include road construction, timber harvest, livestock grazing, toxic chemical spills, and mining (PIF 2000, NatureServe 2011, MPIF 2004, Carlson 2004).

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Habitat Loss/Degradation (nesting, prey availability, and water fluctuations): FW-DC-AR-07 states that the desired condition will be for a transportation system that will be environmentally compatible, and will have minimal impacts on resources such as sensitive species. Newly constructed or reconstructed roads will not encroach into riparian areas and streams in such a way that it impacts channel function or geometry. This desired condition will therefore reduce the effects of roads/trails on harlequin habitat.

Fires, in particular large fires, have the potential to affect harlequin habitat. Not only may fires burn riparian areas, but the potential for sediment, changes in water flows, and changes in downed wood increases post-fire. Fire suppression could alter riparian/aquatic habitats and change the availability of prey species. Fuels reduction and a trend towards the desired conditions for vegetation (FW-DC-VEG-01 through 05, FW-DC-VEG-11, and FW-DC-FIRE-03) will restore/maintain conditions nearer to historic conditions and increase resiliency of forested habitats. This will restore natural processes nearer to what was present historically. There is a lower likelihood of large-scale disturbance altering riparian habitat. Harlequin habitat will be nearer to what was present historically and will be more resilient to disturbance processes.

Vegetation management, if done to move vegetation conditions nearer to historic conditions and the desired conditions for vegetation, will create more resilient stand conditions and lessen the likelihood of a large-scale, stand replacing events. Even if riparian areas had no timber management, the work done in the uplands will reduce the likelihood of insects, disease, or fire in the uplands impacting the adjacent riparian areas. Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year).

Much of the direction in the revised Forest Plan under the “Watershed, Soil, Riparian, and Aquatic Resources” section will maintain or improve riparian areas, and consequently harlequin habitat. In particular, FW-DC-WTR-01, FW-DC-AQH-01, and FW-DC-AQS-01 will maintain/restore stream habitats so that they have natural processes consistent with their natural potential and water quality that supports native species, including invertebrates (harlequin prey). This direction, along with the other direction under the “Watershed, Soil, Riparian, and Aquatic Resources” section, will minimize water fluctuations that are outside the normal range and will also provide habitat for not only harlequin ducks but the invertebrate prey they rely upon. This direction will also maintain nesting habitat.

Grazing can alter riparian habitat by changing vegetation or increasing sedimentation. FW-DC-GRZ-01 states a desired condition that grazing will occur at sustainable levels that protect vulnerable resources. This includes riparian areas and wildlife habitat. This will protect riparian areas and harlequin habitat.

Mineral development, special uses, and lands activities can reduce habitat quality and quantity. FW-STD-RIP-04 states that mine waste and mining facilities should be located outside of RCAs and managed to prevent impacts to RCAs and aquatic resources.

Disturbance: The incorporation of the Access Amendment for grizzly bears in all the alternatives will also improve or maintain harlequin habitat by reducing the amount of roads open to motor vehicle use. This will reduce the potential for disturbance to harlequins where roads are near suitable habitat. Where motorized access still exists near suitable habitat, then the potential for human presence is greater and the chance that harlequin ducks would at least be temporarily displaced to other suitable habitat on the Forest.

FW-GDL-WL-23 provides direction to minimize disturbance around harlequin nests. It will result in a lower probability of a harlequin being displaced to other suitable habitat on the Forest. FW-DC-WL-01 and FW-DC-WL-11 also provide direction to minimize disturbance. GA-DC-WL-LK-04 and GA-DC-WL-SJ-03 provide undisturbed conditions for harlequins during nesting and brood rearing along the St. Joe and Moyie river corridors.

The collection of other forest products may cause disturbance to harlequins, if that activity occurs within a riparian zone where harlequins are present. This may at least temporarily cause harlequins to avoid the area of activity in the short-term.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan.

Recreation is the activity on NFS lands most likely to have impacted harlequin ducks in the past by causing disturbance to individual birds. Roads near waterways may have also impacted habitat and facilitated disturbance to individual birds. Timber harvest near riparian areas may have also altered the availability or habitat or caused disturbance to individual birds.

Timber management is likely to continue on non NFS ownerships. Their effects would depend on the amount of habitat alteration, effects on riparian areas/streams, and the amount of disturbance to individual harlequin ducks.

Grazing will continue on other ownerships, and if it reduces the availability of vegetation within riparian areas, or increases sediment in streams, then harlequin habitat quality could be decreased.

The effects of climate change on water flows could impact harlequin habitat. Water levels could make nesting and foraging habitat unsuitable at times when they historically would have been suitable. Changes in water temperatures could alter the availability of aquatic prey species. It is difficult to predict the exact effects of climate change for harlequin ducks. It could mean a loss of suitable habitat in some areas while newly suitable habitat becomes available elsewhere. This may result in a change in harlequin distribution or abundance on the Forest. Distributional shifts are one way species respond to climate change (page 90 in USDA Forest Service 2010).

Impacts on wintering grounds or during migration can have a large impact on harlequin populations and the number that return to the Forest to breed. Losses of adults during hunting season can limit populations. Nest predation, illegal shooting/trapping, heavy metal poisoning, and oil pollution (wintering grounds) can limit populations as well.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for harlequin duck. This determination is based in part on:

- Much of the direction under the “Watershed, Soil, Riparian, and Aquatic Resources” section of the revised Forest Plan would aid in maintaining or improving habitat conditions for harlequin ducks. Additionally, FW-DC-WL-11 maintains aquatic and riparian habitat;
- Disturbance to harlequin ducks may occur due to management activities and recreationists. FW-DC-WL-01, FW-DC-WL-11, and FW-GDL-WL-23 provide direction to minimize disturbance; and
- GA-DC-WL-LK-04 and GA-DC-WL-SJ-03 provide undisturbed conditions for harlequins during nesting and brood rearing along the St. Joe and Moyie river corridors.

Northern Bog Lemming – Synaptomys borealis chapmani

Affected Environment

The northern bog lemming is part of a group of mammal species associated or dependent on wetland habitats. Northern bog lemming population biology, ecology, habitat description, and relationships identified by research are described in Reichel and Beckstrom (1993, 1994) and Reichel and Corn (1997) and are incorporated by reference. Additional information on the species is included in the Montana Natural Heritage Program (MNHP and MFWP 2011), and NatureServe (2011) databases. Species observations are provided by the state databases and district and Forest records, based in part on formal surveys conducted on the Forests. The northern bog lemming is rarely trapped and is considered one of the least known mice in North America (Reichel and Corn 1997).

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Habitat and Life History Needs

Initially believed to be restricted to fens and bogs, northern bog lemmings have been found in at least nine community types, including Engelmann spruce, subalpine fir, birch, willow, sedge (*Carex*), spike rush (*Eleocharis*), or combinations of the above, often occurring in wet meadows, fens, or bog-like environments (MNHP and MFWP 2011). Most populations in Idaho, however, have been found on peatlands (Boggs and Woods 2004 cited in IDFG 2005) and the best predictor for potential northern bog lemming sites is the presence of large, thick moss mats, particularly sphagnum moss (Reichel and Corn 1997). Known sites in Idaho range in size from 1 to approximately 349 acres (Reichel and Corn 1997).

Northern bog lemmings feed on grasses, sedges, and other herbaceous vegetation, but also snails, slugs, and other invertebrates (Reichel and Corn 1997). Typically occupied habitat has high moisture levels. They feed on grasses and other herbaceous vegetation. They are active day and night throughout the year. They occupy surface runways and burrow systems up to 12 inches deep. They may be found in small colonies with population densities that may reach 36 individuals per acre (Reichel and Corn 1997).

Little is known about northern bog lemming life history and demography (MNHP and MFWP 2011). Information on reproduction is very limited (MNHP and MFWP 2011). No information on movement is available and at this time it is unknown if there is any interaction between individual populations of northern bog lemming (MNHP and MFWP 2011).

Key Stressors

The following Forest Service management activities may have direct or indirect effects on wetland wildlife and their habitats (indirect effects):

- Fire (both planned ignitions and natural, unplanned ignitions) is a needed component to ensure presence of sufficient habitats in appropriate successional condition but can also cause direct mortality;
- Livestock grazing may alter the vegetation community, which may alter the invertebrate community, an important food source for many of these species;
- Long-term fire suppression may alter the vegetation community and increase fire severity;
- Pesticide use could decrease the availability of insects, the primary food source for several of these species;
- Road and right-of-way construction, especially if affects hydrologic function;
- Species like the northern bog lemming (rare, patchily distributed, and confined to rare habitats) are at particular risk of extinction (Shaffer 1981 cited in Reichel and Corn 1997); and

- Northern bog lemmings may also be threatened by human disturbance. Impacts to bogs and wet meadows from off highway vehicles and snowmobiles have the potential to degrade bog lemming habitat and negatively impact the species (Hickman et al. 1999, IDFG 2005).

Stressors outside Forest Service control (cumulative effects) include private land development, water diversions, surface water development, and the risk of extinction as a result of natural factors such as rarity of bog species and habitat.

These stressors can lead to habitat loss, displacement, or mortality.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Loss or Degradation of Bog Habitat: Under the 1987 Forest Plan, sensitive species habitat will continue to be protected to avoid a trend towards federal listing. Direction in the action alternatives to protect peatlands can be found in FW-DC-VEG-12 and FW-GDL-VEG-09. FW-GDL-VEG-09 sets a buffer up to 660 feet around peatlands. Much of the direction in the Watershed, Soils, Riparian, and Aquatic Habitats portions of the action alternatives will also maintain/ or improve peatlands as well. FW-DC-AR-07 states that the transportation system will have minimal impacts on sensitive species, watersheds, aquatic species, and other resources. Taken together, this direction will maintain or restore peatlands.

Fire/Fire Suppression: Fire suppression has potentially impacted northern bog lemming habitat by allowing encroachment of conifers and increasing the risk of a large-scale fire starting in the uplands and moving into the peatlands and bog areas. Higher elevation habitats may only need passive restoration or maintenance. Areas outside of historic conditions at lower elevations may need active restoration. Moving low and mid-elevation stands towards historic conditions and the desired conditions for vegetation will decrease the chance that a large-scale disturbance such as fire would move from the stands into bog lemming habitat.

Alternative A (current Forest Plan as implemented) will be more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire for habitat restoration/maintenance. The use of natural, unplanned ignitions (passive restoration) is more likely in MA1, and Alternative C (335,300 acres) will have the most MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and A (153,900 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

In addition to FW-DC-FIRE-03, MA direction in the revised Forest Plan that supports expanded use of natural, unplanned ignitions and planned ignitions includes: MA1a-DC-VEG-01, MA1a-DC-FIRE-01, MA1a-GDL-FIRE-01 and 02, MA1b-DC-VEG-01, MA1b-DC-FIRE-01, MA1b-GDL-FIRE-01 and 02, MA1c-DC-VEG-01, MA1c-DC-FIRE-01, MA1c-GDL-FIRE-01 and 02, MA1e-DC-VEG-01, MA1e-DC-FIRE-01, MA1e-GDL-FIRE-01 and 02,MA2a-DC-FIRE-01, MA2a-DC-VEG-01, MA2a-GDL-FIRE-01 through 03, MA2b-DC-VEG-01, MA2b-DC-FIRE-01, MA2b-GDL-FIRE-01 through 03,MA5-DC-VEG-01, MA5-DC-FIRE-01, and MA5-GDL-FIRE-01. This will be useful to maintain/restore the uplands that surround bog lemming habitat.

Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year). Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives, with 6,000 acres/year of prescribed burning in Alternative A.

Timber harvest, when done to move towards historic conditions and the desired conditions for vegetation, will improve or maintain upland conditions that influence peatlands and bogs. Timber harvest activities are not likely to occur within or immediately adjacent to peatlands due to the direction listed under forestwide direction; and therefore, disturbance due to human presence is not likely. Direction in the action alternatives to protect peatlands can be found in FW-DC-VEG-12 and FW-GDL-VEG-09. FW-GDL-VEG-09 sets a buffer up to 660 feet around peatlands. Much of the direction in the Watershed, Soils, Riparian, and Aquatic Habitats portions of the revised Forest Plan would also maintain or improve peatlands as well.

Invertebrate Prey (e.g., grazing, pesticides): Under the 1987 Forest Plan, sensitive species habitat would continue to be protected to avoid a trend towards Federal listing. Under the action alternatives, FW-DC-GRZ-01 states that grazing will occur at sustainable levels while protecting vulnerable resources. This will include peatlands and bogs that provide habitat for the northern bog lemming. Pesticides, if used adjacent to peatlands and bogs, may impact invertebrate abundance and therefore food availability for bog lemmings.

Access/Disturbance: Under all alternatives, the Access Amendment lowered road densities and will potentially reduce the chance of disturbance in some bog lemming habitat. FW-DC-AR-07 contains a statement that the transportation system will be environmentally compatible and will have minimal impacts on resources such as sensitive species. The implementation of this desired condition will aid in reducing the effects of access on northern bog lemmings.FW-DC-WL-01 and FW-GDL-WL-25 could be used to set a distance buffer around important occupied northern bog lemming habitat. Direction in the revised Forest Plan to protect peatlands can be found in FW-DC-VEG-12 and FW-GDL-VEG-09. FW-GDL-VEG-09 sets a buffer up to 660 feet around peatlands. Much of the direction in the Watershed, Soils, Riparian, and Aquatic Habitats portions of the revised Forest Plan will also maintain or improve peatlands as well. Off-road motor vehicle use will not be allowed unless in designated areas (MVUM maps), and this minimizes the chance that northern bog lemming habitat will be degraded. Snowmobile use may impact bog lemming habitat through snow compaction and effects on sub-nivean habitat, but FW-GDL-WL-25 and FW-GDL-VEG-09 could be used to minimize the impacts in bog lemming habitat. Human presence in bog lemming habitat may disturb lemmings and limit their use of habitat, at least while the disturbance would be ongoing. The collection of forest products is not likely to impact bog lemmings or their habitat. Most forest products that are collected are found in the uplands, not within peatlands and bogs. Some human presence/disturbance may occur along the edges of northern bog lemming habitat, but the effects are not expected to be great.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Given the natural rarity of bog habitat and bog lemmings, they are susceptible to natural loss of populations. However, also given the natural rarity of that habitat, most activities are not likely to overlap and impact that habitat.

The past activity on NFS lands that is most likely to have impacted northern bog lemming habitat is recreation. Cross-country (non-winter) motor vehicle use is not permitted, except in areas designated on the MVUM maps. These areas are not in or near northern bog lemming habitat. Timber harvest, fuels reduction, and fire suppression potentially altered the vegetation around bog lemming habitat and the surrounding uplands. Fire suppression may have increased the risk of high severity fires near bog lemming habitat.

Recreation is likely to increase on all land ownership types, if for no other reason than human population growth. This may result in an increase in human disturbance and the possibility of motorized use degrading peatlands/bogs on non-NFS lands.

Climate change could change the amount and quality of northern bog lemming habitat. Changes in precipitation and temperature may reduce peatland or bog habitats. The exact extent of the potential impacts are unknown, and it is unknown if new areas of habitat would be created at higher elevations as climate changes. Depending on the amount of new habitat created, and its proximity to existing habitat, displaced northern bog lemmings may or may not have adequate habitat to move to as a result of climate change. Because of induced shifts in habitat, species that are not highly mobile, such as bog lemmings may have difficulty responding to climate change (page 91 in USDA Forest Service 2010). Bog/peatland habitat is naturally fragmented, adding to the difficulty for bog lemmings to shift distribution.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for the northern bog lemming. This determination is based in part on:

- Direction in the revised Forest Plan to protect peatlands can be found in FW-DC-VEG-12 and FW-GDL-VEG-09. FW-GDL-VEG-09 sets a buffer up to 660 feet around peatlands. Much of the direction in the Watershed, Soils, Riparian, and Aquatic Habitats portions of the revised Forest Plan will also maintain/improve peatlands as well;
- FW-DC-WL-01 and FW-GDL-WL-25 could also be used to support setting a distance buffer around important occupied northern bog lemming habitat;
- Off-road motorized use would be not allowed unless in designated areas (MVUM maps), and this minimizes the chance that northern bog lemming habitat would be degraded; and
- Over-snow vehicle use may impact bog lemming habitat through snow compaction and effects on sub-nivean habitat, although there is no known degradation currently occurring to northern bog lemming habitat from over-snow vehicle use. FW-GDL-WL-25 and FW-GDL-VEG-09 could be used to minimize over-snow-motor vehicle use in bog lemming habitat.

Pygmy nuthatch - Sitta pygmaea

Affected Environment

Pygmy nuthatch population biology, ecology, habitat description, and relationships are described in the Birds of North America Online database (Kingery and Ghalambor 2001). Additional information is provided in the Idaho Comprehensive Wildlife Conservation Strategy (IDFG 2005), Idaho Partners in flight (2000) and NatureServe databases (2011).

Information on source habitats and special habitat features are described in Wisdom et al. (2000). The best available sources of ecological and occurrence information are from, the Montana Natural Heritage Program, the Montana and Idaho Partners in flight Bird Conservation Plan (PIF 2000, ID PIF 2000) and NatureServe databases.

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes). The ERG analysis (ERG 2012) looked at vegetation changes over the next 50 years.

Habitat and Life History Needs

Wisdom et al. (2000) identify source habitats for this species as late seral montane forests. For the pygmy nuthatch, this includes multi and single storied lower montane forests. This species is also highly associated with large diameter snags for nesting.

Pygmy nuthatches show a strong and almost exclusive preference for long needled pine forests, such as ponderosa pine, Jeffrey pine, and similar species. They may also inhabit other dry forest habitat types such as Douglas-fir (Kingery and Ghalambor 2001). They tend to favor open, park-like forests. They nest in dead pines and live trees with dead sections, and prefer late successional, mature, undisturbed forests. Unlogged forests host significantly larger populations than logged forests and numbers correlate significantly with volume of ponderosa pine foliage. Pygmy nuthatch correlates directly with snag density and foliage volume of the Forest. In Idaho the pygmy nuthatch is limited in its distribution to the southern slopes of mountains at elevations of 2,000-3,500 feet.

Throughout the intermountain west activities such as timber harvest, fire suppression, and grazing have resulted in extensive changes in the distribution, structure, and species composition of ponderosa pine forest during the last 100-150 years (Agee 1993 cited in IDFG 2005). Loss of historical open, park-like stands of pine during the1900s may be responsible for the drastic declines experienced by this species in recent times (IDFG 2005).

Habitat Estimates

Pygmy nuthatch habitat was modeled by Ecosystem Research Group (ERG) in 2012 (ERG 2012). ERG modeled several scenarios for comparison purposes. Table 70 below displays two of the relevant scenarios. The 1987 Forest Plan was modeled, as was a “no treatment” scenario where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. Both consider a warmer/drier climate over the next five decades as the climate changes. Both of these scenarios also considered that the current level of fire suppression would continue into the future and both considered an increase in acres burned over time due to a warmer/drier climate and fuel loads.

Table 70. Acres of Pygmy Nuthatch Habitat

Decade	1987 Forest Plan	No Treatment Scenario
0	46,372	46,372
1	53,897	51,156
2	58,191	61,305
5	82,301	81,419

Source: Ecosystem Research Group (2012). Both scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Wisdom et al. (2000) identified that there have been widespread declines in source habitats for most species dependent on late successional forest habitats. The primary causes for the decline in late successional forests are intensive timber harvest and large scale fire exclusions. Additional causes include conversion of land to agriculture and to residential or urban development. Analysis of late successional forest and/or the large size class on the Forests (see vegetation write-up in this EIS) has identified that there has been a fairly significant reduction in the amount of late successional forests and stands in the large size class. However, late successional forests are still considered to be well distributed across the Forests. In addition to current late successional forest, the Forests, under the current land management plan, are managing additional lands for their late successional stand characteristics. The current trend under the existing Forest Plan is such that late successional forests are no longer targeted for timber harvest and there is an increase in the number of large diameter trees retained in areas of vegetation management.

Bollenbacher and Hahn (2008) identify that presently in the northern region (based on estimates derived from FIA data), approximately 50 percent of the forested lands have a size class of 10 inches in diameter or greater and that many of these stands have an age class which exceeds 90 years. Over the short and long term natural vegetation succession will result in an increase in the amount of lands in the large size class and subsequently in the amount of late successional forest components, such as snags, and down wood important for this species.

Snags

A snag analysis recently conducted for the Forests (Bollenbacher et al. 2009) provides an estimate of the number of snags currently existing throughout the forested portion of the Forests. The analysis compared the amount of snags in wilderness/roadless areas versus those outside wilderness/roadless areas. The analysis identified that areas outside of wilderness/roadless areas have similar snags per acre to those in wilderness/roadless areas. The snag densities within wilderness/roadless areas provide insight into natural snag abundance and distribution, and this can be compared to areas outside of wilderness/roadless (page 4 in Bollenbacher et al. 2009). The 90 percent confidence intervals for wilderness/roadless area snags overlap with the confidence intervals for areas outside of wilderness/roadless (table 2 in Bollenbacher et al. 2009). In other words, the number of snags outside of wilderness/roadless areas, which represents natural snag abundance, is not very different than the number of snags outside of wilderness/roadless. Please see the snag discussion in the vegetation section of the FEIS and DEIS (pages 69-72 in the DEIS) for more information regarding the findings of Bollenbacher et al. 2009 and the amount of snags available on the Forest.

The estimated average number of snags per acre on all forested lands on the IPNF with diameter at breast height between 10.0” and 19.9” is 10.4 snags with a 90 percent confidence interval of

9.2 to 11.8 snags per acre. The average number of snags per acre with dbh 20" and larger is 1.4 snags per acre with a 90 percent confidence interval of 1.2 to 1.8 snags per acre.

Habitat estimates for the Northern Region and the Northern Rocky Mountain Ecological Province (which includes the Forests) are displayed below (Bush and Lundberg 2008).

Table 71. Estimated Snag Habitat (acres)

	Region One	Northern Rocky Mountain Ecological Province
Habitat	184,952	105,290

Key Stressors

General stressors:

- Loss of mature and late successional dry pine forest and the reduced numbers of snags, particularly large snags;
- Decline in availability of large snags and trees for foraging and nesting;
- Fragmentation of late-successional habitat;
- Fire suppression that results in dense young stands and invasion of Douglas-Fir;
- Selective timber harvesting with subsequent replanting of closely spaced seedlings; and
- Intensive grazing that may remove the shrub and grass understory.

The following Forest Service management activities may impact pygmy nuthatch or its habitat (indirect effects):

- Timber harvest – habitat loss and loss/reduction in secure habitat;
- Fire (both planned ignitions and natural, unplanned ignitions) – removal of standing snags and down wood or direct mortality;
- Road maintenance and construction – habitat loss and loss/reduction in secure habitat; and
- Recreational use – habitat loss or disturbance during use in sensitive habitats.

These stressors can cause habitat loss, displacement, or mortality.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Fire/Vegetation Management: Fire suppression has reduced habitat quality for pygmy nuthatches. It has increased encroachment by shade-tolerant conifers, created a dense understory and eliminated foraging habitat, and retarded the development of large ponderosa pine that are useful for large snags and nesting cavities. The increase in fuels puts the existing large ponderosa pine at an increased risk of being lost in a stand-replacing event. Alternative A would be more likely to continue the active suppression of most fires. The action alternatives have more flexibility to use fire to restore/maintain habitat.

Fuels reduction, in particular when done to trend towards the desired conditions for vegetation (FW-DC-VEG-01 through 07, FW-DC-VEG-11, and FW-DC-FIRE-03), would improve or maintain pygmy nuthatch habitat. Expanded use of natural, unplanned ignitions through FW-DC-VEG-03 would be useful for maintaining and improving pygmy nuthatch habitat.

FW-STD-VEG-01, FW-GDL-VEG-01 and 02, FW-GDL-VEG-04 and FW-GDL-VEG-05, FW-DC-WL-10, FW-DC-WL-11, FW-DC-WL-12, FW-DC-WL-13 move habitat conditions towards historic conditions, make stands more resilient to disturbance, and maintain or improve snag habitat.

By moving towards the desired conditions for vegetation, the amount and distribution of pygmy nuthatch habitat would approximate what would have been present under natural disturbance processes. Drier forests, which are the most likely to be outside of historic conditions due to fire suppression, would be more resilient to large-scale disturbance. The pattern of habitat would be similar to what existed under natural disturbance processes. The risk of a large, stand replacing event impacting a large patch of pygmy nuthatch habitat at one time would be reduced under the action alternatives.

Pygmy nuthatch habitat was modeled by Ecosystem Research Group (ERG) in 2012 (ERG 2012). ERG modeled several scenarios for comparison purposes. Table 72 below displays some of the relevant scenarios. The existing 1987 Forest Plan was modeled, as was a “no treatment” scenario where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. Scenarios consider a warmer/drier climate over the next five decades as the climate changes. These scenarios also considered that the current level of fire suppression would continue into the future and both considered an increase in acres burned over time due to a warmer/drier climate and fuel loads. Under all alternatives pygmy nuthatch habitat will increase over the next five decades. The existing amount of habitat is already within HRV and moves towards the mid-range or HRV in 50 years. This is driven by an increase in low/moderate severity wildfire, some losses to high severity wildfire, and in-growth within larger ponderosa pine size classes (page 88 in ERG 2012). Pygmy nuthatches are not at a viability risk on the IPNF (page 89 in ERG 2012).

Table 72. Acres of Pygmy Nuthatch Habitat

Decade	Alternative B Modified	1987 Forest Plan	No Treatment Scenario
0	46,372	46,372	46,372
1	45,395	53,897	51,156
2	48,816	58,191	61,305
5	59,921	82,301	81,419

Source: Ecosystem Research Group (2012). Scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

For pygmy nuthatch, as with wildlife on the Forest in general, it is wildfire, insects/disease, in-growth, and stand succession that largely determines the amount and pattern of habitat on the Forest for this species rather than management activities (pages ES-1 and ES-2 in ERG 2012).

Under current management (Alternative A), the percentage of the Forest with high snag densities would increase over the next five decades. The percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range would increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 78 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range would increase from approximately 11 percent in decade 1 to 35 percent in decade 5 with an unconstrained budget and 11 percent to 36 percent with constrained budgets.

For Alternative B Modified, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range would increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 81 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range would increase from approximately 12 percent in decade 1 to 36 percent in decade 5 with an unconstrained budget and 12 percent to 37 percent with constrained budgets.

For Alternative C, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range would increase from approximately 73 percent in decade 1 to 76 percent in decade 5 with an unconstrained budget and 73 percent to 83 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range would increase from approximately 12 percent in decade 1 to 37 percent in decade 5 with an unconstrained budget and 12 percent to 39 percent with constrained budgets.

For Alternative D, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range would remain steady at approximately 73 percent in decade 1 to 73 percent in decade 5 with an unconstrained budget and increase from 73 percent to 80 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range would increase from approximately 11 percent in decade 1 to 34 percent in decade 5 with an unconstrained budget and 11 percent to 37 percent with constrained budgets.

Direction in the revised Forest Plan that maintains snag habitat includes: FW-DC-VEG-07, FW-GDL-VEG-04 and 05, and FW-DC-WL-13.

Several variables determine the amount of pygmy nuthatch habitat across the Forest. Fire, fire suppression, climate change, and vegetation management combine and contribute to the availability of habitat. The revised Forest Plan would move vegetation conditions towards a desired condition that would be based on historic conditions (FW-DC-VEG-01 through 07, FW-DC-VEG-11, and FW-DC-FIRE-03). The distribution and amount of pygmy nuthatch habitat should be nearer historic levels if natural disturbance processes are allowed to function, particularly fire (FW-DC-FIRE-03).

The difference between the alternatives would be primarily how much vegetation treatment would be expected each year to trend conditions toward the desired conditions for vegetation. Alternative C (11,031 acres/year) would have the most active restoration followed by Alternatives B Modified (9,465 acres/year), and D (7,912 acres/year) under constrained budgets. Alternative A would treat 10,867 acres/year. With an unconstrained budget, Alternative B Modified (14,190 acres/year) would have the most active restoration followed by Alternatives C (13,195 acres/year) and D (10,790 acres/year). Alternative A would treat 11,537 acres/year. Approximately 5,000 acres/year of prescribed burning would be predicted under the action alternatives, with 6,000 acres/year in Alternative A. Of the alternatives, B Modified (1,683 acres) would be expected to have more regeneration treatments per year with constrained budgets in the first decade, followed by C (1,677 acres), D (1,609 acres), and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) would be expected to have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and A (5,537 acres).

Given the predicted amounts of harvest, active restoration would have little impact on habitat pattern at the Forest scale compared to the potential impacts of fire use. The use of natural unplanned ignitions (passive restoration) would have a much greater likelihood of maintaining or improving habitat pattern across the Forest. Alternative A (current Forest Plan as implemented) would be more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire to restore/maintain habitat. Under the action alternatives, FW-DC-FIRE-03 would be the most useful component in the revised Plan for improving pygmy nuthatch habitat. FW-DC-FIRE-03 reads, "The use of wildland fire (both planned and unplanned ignitions) increases in many areas across the Forest. Fire plays an increased role in helping to trend the vegetation towards the desired conditions while serving other important ecosystem functions. However, when necessary to protect life, property and key resources, many wildfires are still suppressed."

The large/very large size class is currently within desired conditions (historic conditions) for stands on the Forest. With unconstrained budgets, there would be an increase in acres in this size class in the next 50 years for B Modified (+54,243 acres), C (+51,566 acres) and D (+34,730 acres). Alternative A would decline (-10,836 acres). With constrained budgets, there would be an increase in acres in this size class in the next 50 years for Alternatives C (+109,175 acres), B Modified (+102,149 acres), D (+105,372 acres) and A (+83,235 acres). The large/very large size class would remain within HRV.

What this means would be that pygmy nuthatches would find an abundance of stands in the large/very large size class and adequate snags under all alternatives in the next 50 years.

Grazing can reduce the shrub and grass component of dry forest stands. This reduces the ground fuels useful to carry the frequent fires that maintain dry forests. It also reduces the understory vegetation component that provides habitat for some of the invertebrate species that pygmy nuthatches feed on. FW-DC-GRZ-01 states that grazing would occur at sustainable levels while protecting vulnerable resources. Allotment management plans, when they are analyzed, would consider sensitive species habitat and FW-DC-GRZ-01 would be implemented when applicable.

Roads/Access/Disturbance: Alternative C (2,129,490 acres motorized) would have the least acreage allowing motorized use, followed by Alternatives B Modified (2,268,390 acres motorized), D (2,279,590 acres motorized) and A (2,399,138 acres motorized).

Open roads facilitate access for firewood cutters, and the loss of snags near roads can reduce the availability of habitat. However, the abundance of snags near roads was found to be similar to that in wilderness/roadless areas. Recreation can disturb individuals and cause them to temporarily avoid an area, and human presence tends to be highest near roads. Additionally, potential habitat may be lost within the footprint of the road.

FW-GDL-WL-25 and FW-DC-WL-01 would reduce or eliminate the chance of disturbance to pygmy nuthatches. However, given the ephemeral nature of pygmy nuthatch nesting habitat (snags) and that they may not use the same nest each year, it would be possible that some pygmy nuthatches would still be disturbed by human presence and displaced to habitat elsewhere on the Forest.

Timber sales/fuels reduction activities can cause disturbance to pygmy. Individual special use permits may have disturbance effects, but generally would have a small footprint and cause little or no loss of habitat.

The effects of any potential minerals development within pygmy nuthatch habitat would depend on the footprint of the mine, as well as whether it was an above-ground or below-ground mine. Mining activities and the haul/supply route may contribute to disturbance of pygmy nuthatches. Disturbance may result in pygmy nuthatches utilizing other area of the Forest.

The collection of forest products may cause disturbance, but most of that disturbance would be concentrated near open roads.

Cumulative Effects

Please see the "Cumulative Effects Common to Most Species" section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the "Cumulative Effects Common to Most Species" section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past timber harvest, fuels reduction, and fire suppression have changed the amount and pattern of pygmy nuthatch habitat on NFS lands. The drier forest types are often most impacted by fire suppression. Past timber harvest may have influenced the availability of large snags in pygmy nuthatch habitat, and firewood cutting along open roads may also have reduced large snags. Habitat for pygmy nuthatches on the Forest is within HRV, although near the lower end.

Timber management is likely to continue on non NFS ownerships. The effects would depend on how many snags are retained, whether dry forest habitat that is outside of historic conditions is restored, whether late-successional forests are maintained, and the amount of disturbance to individual pygmy nuthatches.

Climate change will have the potential to alter the quality, quantity, or distribution of habitat for this assemblage. A changing climate and the effects of past fire suppression may combine to lower the resiliency of stands to natural disturbance processes. There is a greater likelihood that a large scale disturbance will change pygmy nuthatch habitat. The lower elevation, drier forests are the most in need of active restoration. Moving conditions nearer to historic conditions and the desired conditions for vegetation would restore habitat into a more resilient condition and nearer to what would have been present historically under natural disturbance processes. Climate change may cause a change in timing of the life-cycle of some insects, consequently altering when prey is available for pygmy nuthatches (page 90 in USDA Forest Service 2010).

Grazing will continue on other ownerships, and if it reduces the availability of grasses and shrubs there may be a reduction in some invertebrate prey species. It may also reduce the ground fuels useful to facilitate frequent fires.

Effects Determination

Each of the action alternatives **may impact individuals or habitat, but is not likely to result in a trend towards federal listing or loss of viability** for the northern bog lemming. This determination is based in part on:

- A trend towards the desired conditions for vegetation (FW-DC-VEG-01 through 07, FW-DC-VEG-11) would improve or maintain pygmy nuthatch habitat.
- The revised Forest Plan provides flexibility to use unplanned ignitions through FW-DC-VEG-03 and MA direction and would be useful for maintaining and improving pygmy nuthatch habitat;

- The existing amount of habitat is already within HRV and moves towards the mid-range or HRV in 50 years. Pygmy nuthatches are not at a viability risk on the IPNF (page 89 in ERG 2012);
- Pygmy nuthatches would find an abundance of stands in the large/very large size class and an abundance of snags over the next 50 years; and

Management Indicator Species (MIS)

The following management indicator species (MIS) were proposed because they represent an issue or concern. Elk security habitat was a concern, especially given the importance of this species for hunting. Elk will be an indicator for elk security only. A landbird assemblage (insectivores) was proposed to aid in analyzing the effects of moving towards the desired conditions for vegetation. This assemblage will be used as an indicator for progress towards the desired conditions for vegetation.

These MIS are to be used to compare alternatives in this EIS and analyze effects. Although several individual species are listed under the landbird assemblage, effects will be analyzed for the assemblage in general and not the individual species. These MIS, elk and insectivores, were not proposed because of a viability concern. Additionally, viability of these MIS will not be analyzed in future projects, nor will they be monitored at the project level. See table 73 for the rationale for MIS selection (also see the KIPZ MIS Selection paper, USDA Forest Service 2013b).

Table 73. Management Indicator Species for the Idaho Panhandle National Forests

Species	Habitat Association	Indicator	Rationale for Selection
Rocky Mountain Elk	Forested stands (cover), and grasslands/shrub (forage)	Security Areas (Acres and Percent)	Elk are of high social importance and are sensitive to the availability of security habitat. Management activities that impact road use can alter security habitat. Monitoring of security habitat would be feasible through remote sensing (ex: travel route GIS layers)
Landbird Assemblage (insectivores)	Varies: open forest structures, mature forests, and snags	Varies: open forests/openings, burned forests, mature forests, snags	Moving towards the desired conditions for vegetation would restore or maintain habitat for some species of insectivores. The Forest would monitor movement towards the desired conditions for vegetation

The KIPZ MIS Selection paper (2013) in the project record describes in more detail why these species were selected as MIS, why the old MIS were not retained, what will be monitored, and discusses the scientific criticisms of the MIS concept.

Rocky Mountain Elk – Cervus canadensis nelson

Elk has been proposed as a MIS due to concerns over security habitat for this species. The alternatives will be analyzed relative to their impact on security habitat for elk. Additionally, the impacts of other non-security related direction in the revised Forest Plan were analyzed as well. Also, see the big game analysis section in the document for more effects to big game in general.

Affected Environment

Elk are a hunted species with secure populations. Idaho has a rich tradition of big game hunting. Elk have high economic and social values and is a large contributor to the quality of life in Idaho.

In general, south and central zones of the Forest were used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes). For the security analysis, the elk hunting zone subunits were the agreed upon as the best biologically based unit of measure during coordination with IDFG during the revision process. These analysis units will be called Elk Management Units (EMUs).

Habitat and Life History Needs

Elk are habitat generalists and occupy open to dense forests interspersed with grassland or shrubland openings. Lower elevation winter range with good cover and forage or browse is important to elk. Habitat that reduces vulnerability to hunting, severe winter weather, and predators is important for elk.

Elk eat grasses, sedges, forbs, deciduous shrubs (especially willow and serviceberry), young trees (especially chokecherry and maple), and some conifers (varies between ranges). Where shrubs and grasses are available, grass is preferred. Browse may be used, particularly in winter and on winter ranges. Conifers and arboreal lichens may also be used. Grass is most important in spring. Forbs are important in summer (MNHP and MFWP 2011).

Elk tend to graze more where open habitats are available, and have higher thresholds of snow depths that produce movements or cause physical impairment to movement (Sweeney and Sweeney 1984). This allows elk to inhabit slightly higher terrain (with deeper snows) and delay movements to lower elevation (Sweeney and Sweeney 1984, Boyce 1991). In areas of deeper snow, elk use steeper slopes, which have less snow (Poole and Mowat 2005).

Road construction is the single most important Forest action with potential to affect elk security and unroaded hunting opportunity. The security area calculations associated with Hillis et al. (1991) are based on open motorized routes.

Security areas also become less functional as hunting pressure increases regardless of available access and forest cover. This results from increasing demand for unroaded recreation and also as a result of hunters trying to avoid areas of higher pressure.

A large portion of lands identified as big game winter range have also been delineated as wildland urban interface (WUI). Current management in the WUI emphasizes a reduction in fire risk and an increase in human safety. In some cases, such as immediately adjacent to a home, management to reduce fire risk and improve conditions for human safety are not necessarily compatible with big game habitat maintenance/restoration. However, it is recognized that the priority in those areas closest to structures is human safety and a reduction in fire risk, while outside of those areas management for both is considered more compatible. Areas immediately adjacent to homes are generally not conducive to providing winter range for ungulates anyway, due to the disturbance from human presence.

Key Stressors

Forest Service activities that may have direct or indirect impacts on species within this group include:

- Timber harvest which alters the quantity, quality, and placement of cover. Timber harvest, especially with prescribed fire, can increase forage quality and quantity;
- Prescribed fire by itself can also increase forage quality and quantity;
- Fire suppression can reduce the amount of forage, and alter the quantity, quality, and placement of cover;
- Access management, especially motorized access, can be utilized to protect, or when used in conjunction with hunting, to reduce populations;
- Activities that reduce that amount of security during the big game hunting season; and
- Noxious weeds can also reduce the amount of forage available for elk.

Stressors outside Forest Service control include (cumulative effects):

- The potential spread of chronic wasting disease and other diseases;
- Hunting;
- Vehicle caused mortality;
- Private development, especially in winter range, which can lead to loss of habitat, loss of connectivity, increase in vulnerability (from predators year-round, and during the hunting season);
- The spread of invasive plant species (weeds) reduces forage values and habitat capacity
- Severe winters can contribute to high herd mortality;
- Vegetation/fire management on non-NFS lands effect cover/forage; and
- Increased access (roads) on non-NFS lands.

These stressors can result in habitat loss, displacement, or mortality. The stressors that are outside of Forest Service control can result in population changes. Therefore, the number of elk residing on the Forest is not completely under the control of the Forest.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Vegetation/Fire Management Effects on Cover/Forage: Alternative A will be predicted to treat approximately 10,867 acres/year (constrained budget) or 11,537 acres/year (unconstrained budget) including 6,000 acres/year prescribed fire. The existing 1987 Forest Plan has limited flexibility to use unplanned ignitions to maintain/improve habitat.

Fire suppression has impacted the vegetation component of security habitat for elk. Many areas are outside of historic conditions and in need of active restoration and fuels reduction. If vegetation management will be done to move conditions towards historic conditions and the desired conditions for vegetation and fire (FW-DC-VEG-01 through 06, FW-DC-VEG-11, and FW-DC-FIRE-03), then the vegetation component of elk security habitat will be nearer to what will have been present based on natural disturbance processes. Stands will be more resilient to large-scale disturbance and less likely to be lost to fire/insects/disease. The reintroduction of fire into ecosystems can aid in restoring habitat conditions. As stated in FW-DC-FIRE-03, fire plays an increased role in helping to trend vegetation towards desired conditions.

Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year). Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives, with 6,000 acres/year of prescribed burning in Alternative A. Of the alternatives, B Modified (1,683 acres) will be expected to have more regeneration treatments per year with constrained budgets in the first decade, followed by C (1,677 acres), D (1,609 acres), and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) will be expected to have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and A (5,537 acres). Alternative B Modified (5,884 acres) will have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and then A (5,537 acres).

The ERG report (ERG 2012) did not specifically analyze big game habitat, instead it analyzed a dozen other species that represent a variety of habitats on the IPNF, including some that would occupy habitat that would overlap with low-elevation winter range for big game. Although big game were not specifically analyzed, this conclusion from ERG (2012) is important: "…natural disturbances (in the form of wildfire and certain insects and diseases) are projected to have effects on habitat that render the effects of management less than remarkable at the planning scale…Thus, treatments that may have considerable effects at the unit or project scale are lessened in the larger context of the total amounts of wildfire, disease, insects, and succession at the individual national forest or the KIPZ scale" (page E-4 in ERG 2012). This means is that the IPNF trends towards the desired conditions for vegetation and fire, but that it is natural disturbance processes that determine overall amounts and pattern of wildlife habitats across the IPNF, and active management actions such as fuels reduction and timber harvest have little impact at the Forest scale. In general, management had a positive effect on the amount and distribution of habitat for wildlife. Those desired conditions for vegetation and fire are based on historic conditions, natural disturbance processes, and changing climates. The desired conditions are similar to what wildlife, including big game, would have evolved with on the IPNF, so the amount and pattern of big game habitat would be similar to what they evolved with on the IPNF. This includes the amount of winter range, cover, and forage.

Alternative A (current Forest Plan as implemented) will be more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire for habitat restoration/maintenance. The use of natural, unplanned ignitions (passive restoration) will be more likely in MA1, and Alternative C (335,300 acres) will have the most MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and A (153,900 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

FW-GDL-WL-13 will be applied to reduce the impacts of management on elk security habitat. Timber harvest can benefit security habitat if it is done to trend towards historic conditions and the desired conditions for vegetation. In doing so, the resiliency of the timbered stand component of security habitat is improved or maintained and security habitat is less likely to be lost to a large-scale disturbance (fire, insects, and disease).

Concentrations of livestock can influence elk habitat use. Elk will avoid areas of high livestock use (PNRS 2006), so livestock presence can affect elk use of security areas. Livestock graze on a small proportion of the Forest, so there are many areas free from cattle. Depending on the intensity of grazing, the use of fire can be affected due to the loss of fine ground fuels to carry a fire. Human presence associated with livestock management can also cause disturbance to elk and cause them to avoid those areas. FW-DC-GRZ-01 states that grazing will occur at sustainable levels while protecting vulnerable resources, so this could aid in reducing impacts from livestock where they are found to be a concern.

Noxious weeds are limited or reduced through FW-DC-VEG-10 and FW-OBJ-VEG-02. This improves forage conditions not only in security areas, but across the Forest.

Access: Both motorized and non-motorized access can result in disturbance to big game, including elk (Ciuti et al. 2012, Canfield et al. 1999, Schultz and Bailey 1978, Freddy et al. 1986, Ward and Cupal 1979). As road densities increase, elk habitat effectiveness decreases (Lyon 1984). In some cases ungulates may react more to a person on foot than a motorized vehicle (Eckstein et al. 1979, Richens and Lavigne 1978, Lavigne 1976). White et al. (2005) found that some animals in Yellowstone can habituate to over-snow motorized use and display little or no reaction unless they are approached on foot. This report by White et al. (2005) suggested that active responses by wildlife can be diminished by restricting over-snow motorized travel to predictable routes and times, reducing the number of vehicles in a group and other means.

The response of other big game, such as white-tailed deer, to snowmobiling has been studied as well (Dorrance et al. 1975). Depending on where the activity occurs, such as in an area where hunting is allowed versus where it is not, white-tailed deer may habituate to snowmobile use. In areas where hunting is allowed, the deer reacted more to snowmobiles and may not as easily habituate to human (snowmobile) presence (Dorrance et al. 1975).

Some research on the effects of recreation on big game has been conducted at the Starkey Experimental Forest in Oregon. Wisdom et al. (2005) found that off-road activities such as ATV use, hiking, mountain biking, and horseback riding appear to have a “substantial effect on elk behavior” (page 6 in Wisdom et al. 2005). It should be noted that their “off-road” transects included the use of primitive road beds (page 2 in Wisdom et al. 2005). The study did not include an estimate of the energetic costs of the behavioral effects to elk, so it is unclear what the overall effects were to the individual animal or herd health. However, the study does show that the activities studied can impact elk use of habitat due to disturbance/displacement away from the human activities. The reactions of mule deer during the study were not as clear. Deer did not appear to move as much in response to the activities, but they may have been responding by making small behavioral changes such as using dense cover. Naylor et al. (2009) reported similar results for elk from this study on the Starkey Experimental Forest.

Ciuti et al. (2012) is representative of the impacts of recreation on big game on NFS lands. In Ciuti et al. (2012) they found that the “highest levels of vigilance were recorded on public lands where hunting and motorized recreation activities were cumulative compared to the national park during summer, which had the lowest levels of vigilance.” Elk, and other big game, are hunted on the IPNF, so the findings in Ciuti et al. (2012) are relevant. Ciuti et al. (2012) found that elk decreased their feeding time when closer to roads and became more vigilant as traffic volume increased.

The IPNF acknowledges that all types of recreation, whether motorized or non-motorized, can have disturbance impacts on wildlife, including big game. However, most non-motorized users arrive on the IPNF and navigate to their chosen non-motorized recreation spot by driving a motorized vehicle on the IPNF's road system. Additionally, the number of non-motorized users diminishes with increasing distance from a road. Thus road access influences the distribution of non-motorized use on the IPNF.

The revised Forest Plan includes direction to minimize disturbance to big game from management activities, with the definition of management activity in the revised Forest Plan being "[a]ny activity that is carried out or authorized by the Forest that would result in impacts on natural resources or change human use of the Forest." Access management, both motorized and non-motorized, would classify as a management activity because it would have an impact on natural resources (e.g., big game) and change human use on the Forest (the distribution of motorized or non-motorized recreation). Therefore, the revised Forest Plan does include and acknowledge that non-motorized uses may have an impact on wildlife, including big game. Examples of applicable direction in the revised Forest Plan include FW-GDL-WL-11, FW-GDL-WL-12 and FW-GDL-WL-14 which limit disturbance to big game on winter range and during birthing/parturition.

Although FW-GDL-WL-13 and FW-OBJ-WL-02 specifically mention elk, elk security areas also provide security habitat for other wildlife species, including other big game. Therefore, other big game will benefit from the direction provided in FW-GDL-WL-13 and FW-OBJ-WL-02.

Alternative A will retain the existing amount of recommended wilderness and non-motorized areas. Large areas with limitations on motorized use can aid in providing security, areas with lower disturbance, and connectivity of elk populations. Alternative C (2,129,490 acres motorized, 1,598,067 acres over-snow motorized) would have the least acreage allowing motorized use, followed by Alternatives B Modified (2,268,390 acres motorized, 1,756,980 acres over-snow motorized), D (2,279,590 acres motorized, 1,759,738 acres over-snow motorized) and A (2,399,138 acres motorized, 1,970,537 acres over-snow motorized). Alternative C (335,300 acres) would have the most land in MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and Alternatives A (153,900 acres).

The grizzly bear Access Amendment is incorporated into the revised Forest Plan and all alternatives. The effects will therefore be the same for all alternatives. Implementation will improve security habitat for not only grizzly bears, but for elk as well. FW-DC-AR-06, although directed at providing people solitude and non-motorized experiences in remote settings, doing so will maintain/create areas that may function as security habitat for elk. FW-DC-WL-02 states that a forestwide system of large remote areas will be maintained or created, and these could function as security habitat for elk as well.

Special use permits/lands can affect the amount and quality of elk security habitat. Anything that changes the motorized route location or densities can change security habitat. Special use permits that do not change motorized routes can still affect security by increasing human presence within security areas and thereby changing the quality of those habitats.

Mine activities can reduce the amount of elk security habitat. The footprint of the mine/mill can remove security habitat, as can the haul/supply route. Not only can the footprint of these facilities remove habitat, but the increased access and disturbance can affect habitat near these facilities.

The collection of forest products primarily occurs near open roads. Any collection that occurs away from open motorized routes may cause disturbance to elk. However, the effects are expected to be minor because most collecting occurs near open roads.

Both FW-GDL-WL-13 and FW-OBJ-WL-02 were updated between draft and final based on public and internal comments. They were adjusted to be as consistent as possible with Hillis et al. (1991) as well as be realistic, attainable, and biologically based as possible. FW-OBJ-WL-02 was adjusted to set the objective to increase by one the number of EMUs that has at least 30 percent security. This objective is realistic given the difficulty and long time frames it takes to plan projects, move through litigation, and finally implement the projects on the ground.

Elk has been proposed as a MIS for the revised Forest Plan due to concerns over elk security habitat. Security habitat would be defined in the glossary as timbered stands on NFS lands at least 250 acres in size greater than 0.5 miles from open motorized routes during the hunting season and would be calculated for the area (e.g., planning subunit) as determined at the project level. The concept of security habitat for elk (FW-GDL-WL-13 and FW-OBJ-WL-02) applies to the hunting season and is based on Hillis et al. (1991). The definition in the glossary that applies to FW-GDL-WL-13 and FW-OBJ-WL-02 has been adjusted from the definition in Hillis et al. (1991) by applying it to open motorized routes rather than simply open roads. The reasoning is that motorized trails can have the same impact on security as roads during hunting season when motorized trails may allow easier/quicker access into habitat compared to foot-travel. Motorized routes that are not open to the public for motorized use during the hunting season (including temporary roads) are considered security habitat because they do not fit the recommendations in Hillis et al. (1991) (i.e., they do not provide motorized access during the hunting season). However, the impacts of non-motorized use of closed routes on elk security habitat would be considered at the project level. This is consistent with Hillis et al. (1991) and their discussion of closed roads (page 39 in Hillis et al. 1991) and the potential for impacts of non-motorized use of closed roads on security habitat.

The glossary definition of elk security habitat for FW-GDL-WL-13 uses the term “timbered stand” (non-forested and seed sap stands were filtered out of the calculations for this analysis and are not considered a “timbered stand” for elk security) because many regenerated stands on the Forest contain enough horizontal cover to provide cover for elk, and at larger scales the available data is not fine enough to tease out patches of hiding cover. This may result in small patches of non-hiding cover being lumped into the security areas with analyses done at larger scales, but generally trees grow fast on the IPNF and many stands have enough horizontal cover to provide hiding cover for elk. Analyses at smaller scales (e.g., project level) may be able to use more refined data, if available.

The IPNF will use the EMU as the analysis unit for elk security as this was the agreed upon measurement scale through coordination with the state of Idaho (IDFG). IDFG identified individual EMUs relative to priority areas for elk management and the need for improvement of elk security conditions (i.e., low, medium, and high emphasis) during the revision process. Only portions of the central and southern portions of the IPNF were considered for priority rating by IDF&G at this time due to there already very low security at this time and a desire to see no net loss of elk security over the life of the Plan. This was due in part to an acknowledgement that the northern part of the IPNF already has considerable security provided for grizzly bears in the two recovery areas (SZ and CYZ) that will benefit elk and other wildlife species. The emphasis levels for the elk management units may be updated during the life of the revised Forest Plan based upon continuing coordination with IDFG.

Based on FW-GDL-WL-13 and the definition of elk security habitat in the glossary, security habitat should be maintained or improved on NFS lands during the hunting season. Where possible, where management for elk would be a high emphasis as determined through coordination with the state, security habitat should be improved.

Although Hillis et al. (1991) recommended that the security analysis should not be adjusted for land ownership (page 39 in Hillis et al. 1991), FW-GDL-WL-13, FW-OBJ-WL-02, and the definition of elk security in the glossary applies only to NFS lands. This is because the Forest assumes that non-NFS lands do not contain security habitat, or if it currently does that any existing security habitat may not be retained by those other landowners. Therefore, the Forest would focus elk security habitat calculations on NFS. Any security habitat that exists on other land ownerships would be considered a bonus.

Table 74 displays the existing condition of elk security habitat on the Forest. Security was calculated as timber stands in blocks of habitat greater than or equal to 250 acres in size and greater than or equal to 0.5 mi from an open motorized route during the hunting season. Open motorized routes used for the calculations include all those on the Forest, as well as those adjacent to the Forest that will impact security habitat on the Forest. Security will be calculated only for those acres on the Forest and does not include acres not under NFS management. This table has been updated from that used for the draft EIS. For the draft EIS the calculations were based on blocks greater than or equal to 250 acres in size and greater than or equal to 0.5 mi from an open motorized route. For the analysis for the final EIS, these figures were further filtered by timbered stands (non-timbered and seedling/sapling areas were filtered out). This reduced the figures in the table for this final analysis compared to the draft EIS. Additionally, in order to keep FW-GDL-WL-13, FW-OBJ-WL-02, and the definition of elk security habitat in the glossary closer to the recommendations in Hillis et al. (1991), the calculations were kept to the hunting season only rather than a general “non-winter season” as used for the draft.

Table 74. Status of the 33 Elk Management Units (EMU) Located within and near the Idaho Panhandle NF Boundary in Regards to Elk Security and Prioritization for Improvement by the Idaho Department of Fish and Game

Elk Management Unit	IPNF Zone	Total Size (Acres)	NFS Lands (Acres (%))	Elk Security NFS Lands Only		IDF&G Priority Ranking
				Acres	Percent	
3-1	CDA[1]	151,454	42,699 (28.2%)	8,808	20.6%	Low
3-2	CDA	145,342	69,743 (48.0%)	13,606	19.5%	Low
3-3	CDA	85,506	70,701 (82.7%)	8,784	12.4%	Low
4-2	CDA	63,826	32,418 (50.8%)	2,971	9.2%	Low
4-3	CDA	60,385	28,760 (47.6%)	3,434	11.9%	Low
4-4	CDA	71,388	37,908 (53.1%)	6,061	16.0%	Medium
4-5	CDA	81,245	72,140 (88.8%)	18,464	25.6%	Medium
4-6	CDA	56,041	55,800 (99.6%)	14,432	25.9%	Medium
4-7	CDA	76,749	76,715 (100%)	35,817	46.7%	Medium
4-9	CDA	39,168	39,052 (99.7%)	9,699	24.8%	High
4-10	CDA	53,809	52,978 (98.5%)	4,843	9.1%	High
4-11	CDA	47,597	47,431 (99.7%)	14,793	31.2%	Medium
4-12	CDA	22,337	21,933 (98.2%)	6,543	29.8%	Medium

Elk Management Unit	IPNF Zone	Total Size (Acres)	NFS Lands (Acres (%))	Elk Security NFS Lands Only		IDF&G Priority Ranking
				Acres	Percent	
4-13	CDA	33,981	32,874 (96.7%)	6,428	19.6%	High
4-14	CDA	46,711	42,583 (91.2%)	5,801	13.6%	Medium
4A-1	Kaniksu	30,303	29,058 (95.9%)	5,778	19.9%	Medium
4A-2	Kaniksu	36,155	34,272 (94.8%)	11,416	33.3%	Medium
4A-3	Kaniksu	35,899	22,637 (63.1%)	2,421	10.7%	Medium
6-1	St. Joe	71,857	10,218 (14.2%)	0	0.0%	Low
6-2	St. Joe	62,262	44,834 (72.0%)	7,943	17.7%	High
6-3	St. Joe	79,897	75,795 (94.9%)	16,404	21.6%	High
6-5	St. Joe	133,604	83,550 (62.5%)	10,737	12.9%	High
6-8	St. Joe	84,581	32,320 (38.2%)	3,054	9.4%	Medium
6-9	St. Joe	70,469	29,023 (41.2%)	1,444	5.0%	Medium
7-1	St. Joe	61,387	60,475 (98.5%)	13,847	22.9%	High
7-2	St. Joe	47,311	47,207 (99.8%)	11,200	23.7%	Medium
7-3	St. Joe	55,232	55,167 (99.9%)	14,374	26.1%	High
7-4	St. Joe	89,704	89,678 (100%)	46,672	52.0%	Low
7-5	St. Joe	41,765	27,870 (66.7%)	11,679	41.9%	Medium
7-6	St. Joe	63,705	35,189 (55.2%)	2,025	5.8%	Low
9-1	St. Joe	40,498	22,775 (56.2%)	3,399	14.9%	Low
9-2	St. Joe	50,515	40,246 (79.7%)	24,520	60.9%	Low
9-3	St. Joe	38,935	38,884 (99.9%)	16,044	41.3%	Low

[1] Coeur d'Alene

Christensen et al. (1993) addressed three types of considerations for big game habitat, particularly elk: habitat effectiveness, elk vulnerability, and winter range. Habitat effectiveness covers roads, special features, cover, and scale of analysis, spatial relationships, and domestic livestock. Roads, or the potential for motorized use, are addressed under the revised Forest Plan with FW-GDL-WL-13 along with the other direction discussed elsewhere that will maintain or improve the amount of habitat available with limitations on motorized access. Special features include things such as riparian habitat and movement corridors. Wet areas and riparian areas are addressed with the direction in the "Watershed, Soils, Riparian, Aquatic Habitat, and Aquatic Species" sections of the revised Forest Plan. This direction protects riparian areas. Connectivity is addressed through FW-DC-WL-18, FW-GDL-WL-15, FW-GDL-WL-16, , FW-GDL-17, MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, GA-DC-WL-CDA-03, GA-DC-WL-LK-01, GA-DC-WL-LK-02, GA-DC-WL-PO-01, GA-DC-WL-PR-01, GA-DC-WL-PR-03, GA-DC-WL-SJ-02. Cover is managed according to FW-DC-WL-17 and the desired conditions for vegetation and fire. This analysis for the revised Forest Plan looked at the planning subunits and forestwide for the security analysis, and even beyond the borders of the IPNF for the cumulative effects analysis. Affects to cover/forage were analyzed at the Forest scale, with cumulative effects again looking beyond the IPNF borders. Spatial relationships are address through FW-DC-WL-09, FW-OBJ-WL-02, and FW-GDL-WL-13 which contain references to the distribution of habitat. Domestic livestock do not occur over much of the IPNF, but their impacts will be minimized through FW-DC-GRZ-01.

Elk vulnerability covers factors such as roads, security areas, and cover management (Christensen et al. 1993). Roads and security areas are managed not only with FW-GDL-WL-13 and FW-OBJ-WL-02, but security for elk is also provided by FW-DC-WL-02, FW-DC-WL-04, FW-DC-WL-05, FW-STD-WL-02, MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01, MA3-DC-WL-01, and GA-DC-WL-CDA-02. Cover, as mentioned previously, is managed according to FW-DC-WL-17 and the desired conditions for vegetation and fire.

Winter range factors include forage, cover, roads/disturbance, and livestock management (Christensen et al. 1993). Forage and cover are managed according to FW-DC-WL-17 and the desired conditions for vegetation and fire. Roads and disturbances are managed on big game winter range according to FW-GDL-WL-11, FW-GDL-WL-12, GA-DC-WL-CDA-02, GA-DC-WL-LK-03, and GA-DC-WL-SJ-01. Livestock do not occur over much of the IPNF, but their impacts would be minimized through FW-DC-GRZ-01.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past management on NFS lands, particularly access management, likely impacted the amount and location of elk security habitat on the Forest. Access management has trended towards reducing the amount of motorized routes on the Forest over time. Timber management, fuels reduction, and fire suppression have impacted the amounts and pattern of forage/cover for elk and other ungulates on the Forest. Fire suppression in particular likely had the greatest influence. It likely led to the encroachment of conifers into natural openings and limited the creation of new openings that would provide foraging habitat.

All the action alternatives will contribute toward maintaining or improving elk security habitat through implementation of FW-GDL-WL-13. The Idaho Department of Fish and Game's Elk Management Plan (IDFG 1999) and 2009 Elk Progress Report (IDFG 2009) do a good job of summarizing all the factors influencing elk populations in the Elk Management Zones overlapping the Forest. These factors include predators, fire suppression, timber harvest, subdivision of private lands, noxious weeds, severe winters, and security on all land ownerships. Elk populations were increasing prior to the hard winter of 1996-1997 according to the IDFG's Elk Management Plan (IDFG 1999). The winter of 2007-2008 also likely reduced elk numbers, but prior to that, elk populations had been increasing in the Panhandle region (IDFG 2009).

Timber harvest and fuels reduction occurring on private, state, or Canadian lands may impact the distribution, amount, and quality of big game and may impact connectivity between NFS lands. Activities on other land ownerships may degrade or improve ungulate habitat, particularly winter range on private lands. If timber harvest and fuels reduction are done to move conditions nearer to those present under natural disturbance processes, then ungulate habitat will be maintained/improved. However, if conditions are not maintained or restored to those found under natural disturbance processes, winter range can be degraded. Subdivision of winter range on private lands can lead to loss of winter range for native ungulates. Fuels reduction near these homes has the potential to degrade winter range, as discussed above. The desired conditions for vegetation in the revised Forest Plan will maintain or improve not only security habitat on the Forest, but also cover/forage for native ungulates. Vegetation management that trend towards historic conditions and the desired conditions for vegetation on the Forest will move conditions nearer to what will have been present under natural disturbance processes. Therefore the amount and pattern of ungulate habitat, including winter range, on the Forest will be similar to conditions that ungulates evolved with under natural disturbance processes.

Any construction of roads on other land ownerships, as well as subdivision and development, may decrease security habitat not only on those lands, but also on the immediately adjacent NFS lands.

Private land development and increased road densities or increased use of existing roads can impact connectivity. Vehicle-elk collisions can cause direct mortality to elk as well.

Climate change will likely have little impact on the motorized route aspect of elk security habitat. However, it may have an impact on vegetation and therefore the timber stand component of security habitat. Past fire suppression has increased stand densities and decreased the resiliency of some stands to large-scale disturbance (fire, insects, and disease). Climate change may increase the likelihood of large-scale disturbance. However, moving stand conditions towards historic conditions and the desired conditions for vegetation will decrease stand densities and increase their resiliency to large-scale disturbance. Habitat conditions will be nearer to what would be present under natural disturbance processes. The timbered stand component of security habitat for elk will be nearer to what was present historically, and will be more resilient to large-scale disturbance and the impacts of climate change. Climate change may impact the timing of elk use of particular areas (i.e., change the timing of movement between seasonal ranges, page 92 in USDA Forest Service 2010).

Hunting, managed by the state, can impact elk populations. Depending on the management goals, hunting regulations can lead to decreasing, increasing, or stable populations. Diseases, such as chronic wasting disease, can also impact elk populations and cause a decline. Severe weather can impact herds and cause a decline.

Effects Determination

Each of the action alternatives **may impact security habitat** and the vegetation components of cover/forage for elk. This determination is based in part on:

- Based on FW-GDL-WL-13, security habitat will be maintained or increased over the life of the Forest Plan;
- During the winter period, FW-GDL-WL-11 and 12 are designed to minimize or avoid disturbance to big game on winter ranges, and FW-GDL-WL-14 reduces disturbance on calving areas;
- In addition to the desired conditions for vegetation and fire, habitat connectivity will be improved through FW-DC-WL-18, and FW-GDL-WL-15 through 17;
- Additional direction within the revised Forest Plan that contributes to areas with low levels of disturbance for elk includes: GA-DC-WL-CDA-02; and GA-DC-WL-SJ-01;

- Connectivity will be also improved by: GA-DC-WL-CDA-03, GA-DC-WL-LK-01 and 02, GA-DC-WL-PO-01, GA-DC-WL-PR-01 and 03, and GA-DC-WL-SJ-02;
- Wilderness areas (MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01), IRAs, and other non-motorized areas (FW-STD-WL-02, FW-GDL-WL-13, MA3-DC-WL-01, and MA5-DC-WL-01) contribute to secure habitat and connectivity for elk; and
- Habitat for native ungulates will be managed in coordination with state agencies, with cover/forage managed based on the desired conditions for vegetation in the revised Plan (FW-DC-WL-17).

Landbird Assemblage (Insectivore)

The insectivore assemblage would be a MIS for vegetation change associated with timber harvest and fuels reduction. This MIS would be used to analyze progress towards the desired conditions for vegetation. This assemblage consists of olive-sided flycatcher, dusky flycatcher, Hammond's flycatcher, chipping sparrow, and hairy woodpecker; all of which were detected on the Forest during the Landbird Monitoring Program conducted by the Avian Science Center (http://globe.gcs-holdings.net/avian/GoogleMap.aspx?project=LBMP). A review of the literature shows that landbirds can have varied responses (densities) to thinning and burning treatments such as those that would be expected in order to move towards the desired conditions for vegetation (Gaines et al. 2007, Gaines et al. 2010, Saab et al. 2007). Hammond's flycatcher was included because it uses mature coniferous forests, and the hairy woodpecker was included because it uses snags for foraging and nesting.

Not only are the effects from the desired conditions for vegetation/fire analyzed, but the effects from other direction in the revised Forest Plan on this landbird assemblage were analyzed as well.

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes). The ERG analysis (ERG 2012) looked at vegetation changes over the next 50 years.

Affected Environment

Chipping sparrow, hairy woodpecker, Hammond's flycatcher, olive-sided flycatcher, and dusky flycatcher population biology, ecology, habitat description, and relationships are described in the Birds of North America Online database (http://bna.birds.cornell.edu/bna). Additional information is provided at the NatureServe database (http://www.natureserve.org/explorer/index.htm).

Habitat and Life History Needs

The following information came from the NatureServe database (http://www.natureserve.org/explorer/index.htm) and the Birds of North America Online database (http://bna.birds.cornell.edu/bna):

The chipping sparrow prefers open, coniferous woodlands, edges near openings, and early-successional forests with shrubs. They feed in low vegetation or on the ground for insects and the seeds of grasses and annuals.

The hairy woodpecker uses coniferous forests, including mature forests, along with edges and burned areas. They utilize cavities in snags for nesting. They primarily feed on insects found on the surface or subsurface of trees.

The Hammond's flycatcher uses mature coniferous forests that contain canopy openings. They primarily capture aerial insects by flycatching.

The olive-sided flycatcher uses open coniferous forests, edges near openings, or early-successional forests if they contain residual conifers or snags to provide singing and foraging perches. They primarily capture aerial insects by flycatching.

The dusky flycatcher uses open coniferous forests, open areas with scattered trees, and brushy areas. They primarily capture aerial insects by flycatching.

Table 75 displays two of the relevant scenarios modeled for chipping sparrow and dusky flycatcher habitat (ERG 2012). ERG modeled several scenarios for comparison purposes. The existing 1987 Forest Plan was modeled, as was a “no treatment” scenario where no mechanical treatment was modeled. This was done for comparison purposes and to put management under the 1987 Forest Plan into context. Both consider a warmer/drier climate over the next five decades as the climate changes. Both of these scenarios also considered that the current level of fire suppression would continue into the future and both considered an increase in acres burned over time due to a warmer/drier climate and fuel loads. The existing amount of habitat is within HRV and increases over the next five decades.

Table 75. Acres of Chipping Sparrow and Dusky Flycatcher Habitat

Decade	1987 Forest Plan	No Treatment Scenario
0	156,004	156,004
1	154,904	154,794
2	154,803	156,298
5	157,392	157,158

Source: Ecosystem Research Group (2012). Both scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Table 76 displays two of the relevant scenarios modeled for olive-sided flycatcher habitat (ERG 2012). The existing amount of habitat is within HRV and remains within HRV over the next five decades.

Table 76. Acres of Olive-sided Flycatcher Habitat

Decade	1987 Forest Plan	No Treatment Scenario
0	1,777,479	1,777,479
1	1,537,610	1,531,926
2	1,387,247	1,385,975
5	1,318,656	1,277,106

Source: Ecosystem Research Group (2012). Both scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Table 77 displays two of the relevant scenarios modeled for Hammond's flycatcher habitat (ERG 2012). The existing amount of habitat is below HRV but increases towards HRV over the next five decades.

Table 77. Acres of Hammond's Flycatcher Habitat

Decade	1987 Forest Plan	No Treatment Scenario
0	740,899	740,899
1	660,708	670,441
2	815,462	822,268
5	915,138	901,291

Source: Ecosystem Research Group (2012). Both scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Table 78 displays two of the relevant scenarios modeled for hairy woodpecker habitat (ERG 2012). The existing amount of habitat is at the high end of HRV and increases over the next five decades.

Table 78. Acres of Hairy Woodpecker Habitat

Decade	1987 Forest Plan	No Treatment Scenario
0	2,098,871	2,098,871
1	2,028,850	2,041,458
2	2,089,899	2,075,979
5	2,227,729	2,239,569

Source: Ecosystem Research Group (2012). Both scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Key Stressors

These stressors can cause habitat loss, displacement, or mortality.

General stressors (could occur on other land ownerships):

- Decline in availability of large snags and trees for perching and nesting;
- Fire suppression that results in dense young stands, encroachment of conifers into openings, and loss of open-forest structure;
- Selective timber harvesting with subsequent replanting of closely spaced seedlings;
- Intensive grazing that may remove the shrub and grass understory;
- Alteration or loss of wintering habitat; and
- Wind turbines – mortality on migratory birds.

The following Forest Service management activities may impact insectivores or their habitat (indirect effects):

- Timber harvest – loss of snags and large trees;
- Fire (both planned ignitions and natural, unplanned ignitions) – removal of standing snags or direct mortality, although fire also maintains open habitat and creates snags;
- Fire suppression – loss of openings and open-forest structure;

- Road maintenance and construction – habitat loss; facilitates firewood harvest, and loss of snags; and
- Recreational use – habitat loss or disturbance.

The population levels of the species in this landbird assemblage are determined in part by the stressors occurring on other land ownerships. The activities that the Forest undertakes do not solely determine the population levels of these species on the Forest.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Fire/Vegetation Management: Fire suppression has degraded habitat for members of this assemblage. Alternative A will be more likely than the action alternatives to result in continued suppression of most fires. Under the action alternatives there is more flexibility to use fire for habitat restoration/maintenance. Dry forest stands that once had more frequent fires and generally had a more open understory now have more ladder fuels than would have been present under natural disturbance. This increases the chance that a large-scale disturbance (e.g., fire, insects) would impact habitat. The Forest is generally lacking ponderosa pine and larch, as shown in FW-DC-VEG-11. In order to move towards historic conditions, as shown in FW-DC-VEG-11, active restoration may need to occur to thin stands before fire can be reintroduced into some ecosystems. Doing so will make those stands more resilient to large-scale disturbance. It will also create and maintain the open habitats that members of this assemblage use.

All three action alternatives trend vegetation conditions towards desired conditions (FW-DC-VEG-01 through FW-DC-VEG-08, FW-DC-VEG-10, FW-DC-VEG-11, FW-GDL-VEG-03 through 06, and FW-DC-FIRE-03), which are based on historic conditions and natural disturbance processes. Vegetation conditions, under all action alternatives, will be maintained or improved for insectivores and their prey in the long-term by creating a more resilient landscape. The difference between the alternatives will be primarily how much vegetation treatment would be predicted each year to trend conditions toward the desired conditions for vegetation. Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year). Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives, with 6,000 acres/year of prescribed burning in Alternative A. Of the alternatives, B Modified (1,683 acres) will be expected to have more regeneration treatments per year with constrained budgets in the first decade, followed by C (1,677 acres), D (1,609 acres), and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) will be expected to have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and A (5,537 acres).

Given the limited progress towards the desired conditions that can be made given the predicted budgets, the use of fire is more effective at moving towards the desired conditions. Alternative A (current Forest Plan as implemented) will be more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire for habitat restoration/maintenance. The use of natural, unplanned ignitions (passive restoration) will be more likely in MA1, and Alternative C (335,300 acres) will have the most MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and A (153,900 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

MA direction in the revised Forest Plan that supports expanded use of natural, unplanned ignitions and planned ignitions includes: MA1a-DC-VEG-01, MA1a-DC-FIRE-01, MA1a-GDL-FIRE-01 and 02, MA1b-DC-VEG-01, MA1b-DC-FIRE-01, MA1b-GDL-FIRE-01 and 02, MA1c-DC-VEG-01, MA1c-DC-FIRE-01, MA1c-GDL-FIRE-01 and 02, MA1e-DC-VEG-01, MA1e-DC-FIRE-01, MA1e-GDL-FIRE-01 and 02,MA2a-DC-FIRE-01, MA2a-DC-VEG-01, MA2a-GDL-FIRE-01 through 03, MA2b-DC-VEG-01, MA2b-DC-FIRE-01, MA2b-GDL-FIRE-01 through 03,MA5-DC-VEG-01, MA5-DC-FIRE-01, and MA5-GDL-FIRE-01. This will be useful to maintain/restore insectivore habitat in the long-term.

GA direction that assists in trending towards the desired conditions for vegetation and fire includes: GA-DC-VEG-CDA-01, GA-DC-VEG-LK-01 and 02, GA-DC-VEG-PO-01 through 03, GA-DC-FIRE-PO-01, GA-DC-VEG-PR-01 through 04, GA-DC-FIRE-PR-01, GA-DC-VEG-SJ-01 through 04, and GA-DC-FIRE-SJ-01.

The increased use of fire, both planned ignitions and natural, unplanned ignitions, will maintain or improve the pattern of insectivore habitat across the Forest. Managing for the desired conditions for vegetation (historic conditions) will likely result in a pattern of insectivore habitat similar to what was found historically under natural disturbance processes.

"Perhaps the single greatest challenge for forest managers nationwide is the restoration of fire regimes as a vital component of healthy forest ecosystems. Many forest types, as well as birds and other wildlife of high conservation concern, require natural fire cycles, and a century of unnatural fire suppression has created conditions that are not only harmful to bird populations, but also pose grave economic and safety threats to humans" (NABCI 2011).

Under current management (Alternative A), the percentage of the Forest with high snag densities will increase over the next five decades. The percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 78 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 11 percent in decade 1 to 35 percent in decade 5 with an unconstrained budget and 11 percent to 36 percent with constrained budgets.

For Alternative B Modified, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 81 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 12 percent in decade 1 to 36 percent in decade 5 with an unconstrained budget and 12 percent to 37 percent with constrained budgets.

For Alternative C, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 76 percent in decade 5 with an unconstrained budget and 73 percent to 83 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 12 percent in decade 1 to 37 percent in decade 5 with an unconstrained budget and 12 percent to 39 percent with constrained budgets.

For Alternative D, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range wll remain steady from approximately 73 percent in decade 1 to 73 percent in decade 5 with an unconstrained budget and increase from 73 percent to 80 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 11 percent in decade 1 to 34 percent in decade 5 with an unconstrained budget and 11 percent to 37 percent with constrained budgets.

The large/very large size class is currently below desired conditions (historic conditions) for stands on the Forest. With unconstrained budgets, there will be an increase in acres in this size class in the next 50 years for Alternatives B Modified (+54,243 acres), C (+51,566 acres), D (+34,730 acres), and A (+10,836 acres). With constrained budgets, there will be an increase in acres in this size class in the next 50 years for Alternatives C (+109,175 acres), B Modified (+102,149 acres), D (+105,372 acres) and A (+83,235 acres). The large/very large size class would remain within HRV.

What this means is that insectivores will find an increase of stands in the large/very large size class and adequate snags under all alternatives in the next 50 years.

Table 79 displays some of the relevant scenarios jointly modeled for chipping sparrow and dusky flycatcher habitat (ERG 2012). The existing amount of habitat is slightly below HRV and decreases slightly over the next five decades under all the action alternatives. The action alternatives are similar in outcomes. However, the “HRV range may be an overestimate of historic habitat since some acres may have lacked sufficient openness to support chipping sparrows and dusky flycatchers” (page 90 in ERG 2012). The change in habitat amount over time is due to an increase in habitat due to low/moderate severity fires coupled with a loss of habitat due to root disease. Since habitat remains near the lower end of HRV, there is no indication that these two species are at a viability risk (page 90 in ERG 2012).

Table 79. Acres of Chipping Sparrow and Dusky Flycatcher Habitat

Decade	Alternative B Modified	1987 Forest Plan	No Treatment Scenario
0	156,004	156,004	156,004
1	149,363	154,904	154,794
2	143,342	154,803	156,298
5	145,743	157,392	157,158

Source: Ecosystem Research Group (2012). Scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Table 80 displays some of the relevant scenarios modeled for olive-sided flycatcher habitat (ERG 2012). The existing amount of habitat is within HRV and remains within HRV over the next five decades. The alternatives have similar outcomes. The changes in habitat are driven by wildfires, insects, and root disease. There is no indication of a viability risk to olive-sided flycatcher (page 94 in ERG 2012).

Table 80. Acres of Olive-sided Flycatcher Habitat

Decade	Alternative B Modified	1987 Forest Plan	No Treatment Scenario
0	1,777,479	1,777,479	1,777,479
1	1,555,850	1,537,610	1,531,926

Decade	Alternative B Modified	1987 Forest Plan	No Treatment Scenario
2	1,423,660	1,387,247	1,385,975
5	1,304,871	1,318,656	1,277,106

Source: Ecosystem Research Group (2012). Scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Table 81 displays some of the relevant scenarios modeled for Hammond's flycatcher habitat (ERG 2012). The existing amount of habitat is below HRV but increases towards HRV over the next five decades. The alternatives have similar outcomes. The changes in habitat are driven by forest growth offset by wildfire. There is no indication that there is a viability risk to Hammond's flycatcher (page 93 in ERG 2012).

Table 81. Acres of Hammond's Flycatcher Habitat

Decade	Alternative B Modified	1987 Forest Plan	No Treatment Scenario
0	740,899	740,899	740,899
1	674,816	660,708	670,441
2	830,710	815,462	822,268
5	938,060	915,138	901,291

Source: Ecosystem Research Group (2012). Scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

Table 82 displays some of the relevant scenarios modeled for Hammond's flycatcher habitat (ERG 2012). The existing amount of habitat is at the high end of HRV and increases over the next five decades. The alternatives result in similar outcomes. The increase in habitat is driven by extensive rood disease, insect outbreaks, and fire. There is no indication that hairy woodpeckers are at a viability risk (page 92 in ERG 2012).

Table 82. Acres of Hairy Woodpecker Habitat

Decade	Alternative B Modified	1987 Forest Plan	No Treatment Scenario
0	2,098,871	2,098,871	2,098,871
1	2,030,486	2,028,850	2,041,458
2	2,073,145	2,089,899	2,075,979
5	2,257,868	2,227,729	2,239,569

Source: Ecosystem Research Group (2012). Scenarios consider a warmer/drier climate and a continuance of the current level of fire suppression

For the landbird assemblage, as with wildlife on the Forest in general, it is wildfire, insects/disease, in-growth, and stand succession that largely determines the amount and pattern of habitat on the Forest for these species rather than management activities (pages ES-1 and ES-2 in ERG 2012).

These insectivores are not dependent on old growth. However, for those species that use mature forests, old growth can contribute to available habitat (FW-STD-VEG-01 and 02, FW-GDL-VEG-01 and 02).

Additional directions in the revised Forest Plan that will benefit members of this group by maintaining or improving habitat include: FW-DC-WL-10 through 15, FW-GDL-WL-08, and FW-DC-GRZ-01.

The direction in the Forest Plan maintains/improves the habitat components this group uses, including snags, mature forest, openings/edge habitat, and open forest. By trending towards the desired conditions for vegetation and fire, the Forest will provide a similar diversity of habitats and pattern across the Forest as would have been found historically under natural disturbance processes. That means the species in this group will find an amount and arrangement of habitats similar to what they evolved with on the Forest. Additionally, stands will be more resilient to large-scale disturbance (fire, insects, and disease).

Grazing can reduce the shrub and grass component of open forest stands. This reduces the ground fuels useful to carry the frequent fires that maintain dry forests. It also reduces the understory vegetation component that provides habitat for some of the invertebrate species that this group feeds on. FW-DC-GRZ-01 states that grazing will occur at sustainable levels while protecting vulnerable resources.

Access/Disturbance: Alternative A will retain the existing amount of recommended wilderness and non-motorized areas. Large areas with limitations on motorized use can aid in providing security and connectivity. Alternative C (2,129,490 acres motor vehicle) will have the least acreage allowing motor vehicle use, followed by Alternatives B Modified (2,268,390 acres motor vehicle use), D (2,279,590 acres motor vehicle use) and A (2,399,138 acres motor vehicle use). Alternative C (335,300 acres) would have the most land in MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and Alternatives A (153,900 acres).

MA5 can also contribute to security. Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

Human access can cause individuals of this assemblage to be displaced from the vicinity of the disturbance. This effect is more common along open roadways as that is where most of the human presence will be concentrated. Additionally, access via open roads facilitates firewood cutting, and results in a loss of snags near roadways. The loss of snags will make the areas around open roads even less desirable for some members of this assemblage. All alternatives will improve access conditions for this assemblage through application of the Access Amendment for grizzly bears. Some roads will be closed and therefore decrease the acreage potentially affected by woodcutting and high human disturbance.

The primary impact from special use permits will likely be disturbance. However, some habitat loss or alteration may also occur. Mineral development could lead to the loss of habitat and increased human presence and therefore disturbance to members of this assemblage in the vicinity of the activities. Individuals may be displaced to habitat elsewhere on the Forest. The footprint of a mine and mill may decrease available habitat by removing live trees and snags. The collection of forest products will result in a loss of habitat and human presence/disturbance that could displace individuals of this assemblage. Firewood cutting in particular will result in a loss of snag habitat along open roadways. The collection of other forest products besides firewood gathering also tends to be associated with open roads due to the ease of access. The snag loss in particular will reduce the suitability of habitat near open roadways for some species in this assemblage.

Vegetation/fire management activities can also cause short-term disturbance, although there will be long-term habitat improvements/maintenance.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past timber harvest, fuels reduction, and fire suppression are the most likely past activities that influenced the amount and distribution of bird habitat on NFS lands. Fire suppression in particular is likely to have changed stand structure and led to encroachment of conifers into natural openings and increased tree densities in formerly open canopied stands. Open roads likely impacted the distribution of snags due to firewood cutting. Road influences have decreased over time as access management has resulted in less routes open to motor vehicle use.

Timber management is likely to continue on non NFS ownerships. The effects would depend on how many snags are retained, whether habitat that is outside of historic conditions is restored, whether late-successional forests are maintained, and the amount of disturbance to individual members of this assemblage.

Climate change will have the potential to alter the quality, quantity, or distribution of habitat for this assemblage. A changing climate and the effects of past fire suppression may combine to lower the resiliency of stands to natural disturbance processes. There is a greater likelihood that a large scale disturbance will change habitat for this assemblage. Although some members of this assemblage may do well after a large fire or disturbance, others will not. Moving conditions nearer to historic conditions and the desired conditions for vegetation will restore/maintain habitat into a more resilient condition and nearer to what would have been present historically under natural disturbance processes. Climate change may cause a change in timing of the life-cycle of some insects, consequently altering when prey is available for this assemblage (page 90 in USDA Forest Service 2010).

Grazing will continue on other ownerships, and if it reduces the availability of grasses and shrubs there may be a reduction in some invertebrate prey species. It may also reduce the ground fuels useful to facilitate frequent fires in some portions of some ecosystems.

Effects in wintering areas or during migration can reduce populations of the members of this assemblage. Wind turbines, for example, can kill individuals during migration.

Effects Determination

Each of the action alternatives **may impact** this assemblage and their habitat. This determination is based in part on:

- All three action alternatives trend vegetation conditions towards desired conditions (FW-DC-VEG-01 through FW-DC-VEG-08, FW-DC-VEG-10, FW-DC-VEG-11, FW-GDL-VEG-03 through 06), which are based on historic conditions and natural disturbance processes. Vegetation conditions, under all action alternatives, will be maintained or improved for insectivores and their prey in the long-term, at the very least by creating a more resilient landscape;

- Alternative C (11,031acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (14,115 acres/year) under constrained budgets. Alternative A will treat 10,867 acres/year. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year) and D (10,790 acres/year). Alternative A will treat 11,537 acres/year. Approximately 5,000 acres/year of prescribed burning would be predicted under the action alternatives, with 6,000 acres/year in Alternative A;
- MA direction in the revised Forest Plan that supports expanded use of natural, unplanned ignitions and planned ignitions includes: MA1a-DC-VEG-01, MA1a-DC-FIRE-01, MA1a-GDL-FIRE-01 and 02, MA1b-DC-VEG-01, MA1b-DC-FIRE-01, MA1b-GDL-FIRE-01 and 02, MA1c-DC-VEG-01, MA1c-DC-FIRE-01, MA1c-GDL-FIRE-01 and 02, MA1e-DC-VEG-01, MA1e-DC-FIRE-01, MA1e-GDL-FIRE-01 and 02,MA2a-DC-FIRE-01, MA2a-DC-VEG-01, MA2a-GDL-FIRE-01 through 03, MA2b-DC-VEG-01, MA2b-DC-FIRE-01, MA2b-GDL-FIRE-01 through 03,MA5-DC-VEG-01, MA5-DC-FIRE-01, and MA5-GDL-FIRE-01. This will be useful to maintain/restore insectivore habitat in the long-term;
- The increased use of fire, both planned ignitions and natural, unplanned ignitions, will maintain or improve the pattern of insectivore habitat across the Forest. Managing for the desired conditions for vegetation (historic conditions) will likely result in a pattern of insectivore habitat similar to what was found historically under natural disturbance processes;
- There is no indication that a change in habitat relative to HRV over the next five decades under the revised Forest Plan is a viability risk to any of these species (ERG 2012); and
- Vegetation/fire management activities can also cause short-term disturbance, although there would be long-term habitat improvements/maintenance.

Other Species or Habitat Components

Migratory Birds

Affected Environment

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

On January 10, 2001, President Clinton signed an Executive Order (13186) titled “Responsibilities of Federal Agencies to Protect Migratory Birds.” The executive order states that environmental analysis of federal actions, required by NEPA or other established environmental review processes, evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern.

A MOU between the Forest Service and USFWS was signed in 2008 (USDA Forest Service and USDI Fish and Wildlife Service 2008) (Forest Service Agreement #08-MU-1113-2400-264). The MOU outlines the responsibilities for both parties regarding migratory birds, including the Forest Service’s responsibilities regarding consideration of migratory birds in NEPA projects. The MOU was used to help guide the development of this effects analysis.

In January of 2000 the Forest Service released a Landbird Strategic Plan (USDA Forest Service 2000). The primary purpose of the strategic plan was to provide very general guidance for the agency's landbird conservation program. Among the suggested actions was the incorporation of landbird management into Forest Plans.

A recent report issued by several organizations and federal agencies summarized the general condition of birds across the United States (North American Bird Conservation Initiative 2009, 2011). It painted a picture of declines in multiple species across a variety of habitats. Climate change was one of the contributing factors to these declines, and is likely to continue impacting birds into the future. As the climate warms, breeding seasons and migrations are being altered. These activities may become out of sync with prey abundance, and climate change may also impact where and when those food items are available. This reinforces the need to have resilient habitat that is better able to handle climate change.

The following series of tables (tables 83 through 86) are included to provide a framework to focus the discussion and analysis by focusing on migratory bird priority species and habitats.

Partners in Flight (PIF) produced a North American Landbird Conservation Plan in 2004 (Rich et al. 2004). Their plan was broken down by "biomes" and the Forest is located within the Intermountain West Avifaunal Biome, which includes several Bird Conservation Regions and encompasses several western states. Their plan is very broad in scale. Table 83 displays the species they identified for continental importance within the Intermountain West Avifaunal Biome.

Table 83. Species of Continental Importance Identified for the Intermountain West Avifaunal Biome in the Partners in Flight North American Landbird Conservation Plan (Rich et al. 2004)

Species	Primary Habitat	Is the Forest within the Range of the Species?[1]
Immediate Action[2]		
Gunnison Sage-Grouse	Western shrublands	N
Greater Sage-Grouse	Western shrublands	N
Bendire's Thrasher	Western shrublands	N
California Condor	Various	N
Spotted Owl	Coniferous Forest	N
Management[3]		
Brewer's Sparrow	Western shrublands	Y
Pinyon Jay	Woodland	N
Lewis's Woodpecker	Riparian	Y
Cassin's Finch	Coniferous forest	Y
Willow Flycatcher	Riparian	Y
White-throated Swift	Various	Y
Rufous Hummingbird	Western shrublands	Y
Black Swift	Various	Y
Olive-sided Flycatcher	Coniferous forest	Y
Swainson's Hawk	Grassland	Y
Grace's Warbler	Mixed forest	N
Long-term Planning and Responsibility[4]		

Species	Primary Habitat	Is the Forest within the Range of the Species?[1]
Black Rosy-Finch	Tundra	Y
Brown-capped Rosy-Finch	Tundra	N
Sage Thrasher	Western shrublands	N
Gray Flycatcher	Woodland	N
Calliope Hummingbird	Western shrublands	Y
Red-naped Sapsucker	Mixed forest	Y
Williamson's Sapsucker	Coniferous forest	Y
Green-tailed Towhee	Western shrublands	N
Clark's Nutcracker	Coniferous forest	Y
Dusky Flycatcher	Western shrublands	Y
Sage Sparrow	Western shrublands	N
Mountain Bluebird	Western shrublands	Y
Gray Vireo	Woodland	N
Virginia's Warbler	Woodland	N
Flammulated Owl	Coniferous forest	Y
White-headed Woodpecker	Coniferous forest	Y
McCown's Longspur	Grassland	N

[1] NatureServe Explorer http://www.natureserve.org/explorer/index.htm on 9/20/10 or KIPZ MIS Process and AMS Technical Report in the project record; includes accidental, migratory, or transient occurrences

[2] PIF categorized species by the level of immediacy of conservation attention. Those in the "immediate action" category are identified to reverse/stabilize significant long-term population declines, or to protect species with the smallest populations with unknown population trends (page 25 in Rich et al. 2004). None of these species occur on the Forest

[3] PIF categorized species by the level of immediacy of conservation attention. Those in the "management" category are identified because management/conservation actions are needed to halt long-term population declines or sustain vulnerable populations (page 26 in Rich et al. 2004). The Forest is within the range of nine of these species

[4] PIF categorized species by the level of immediacy of conservation attention. Those in the "long-term planning and responsibility" category are identified because planning is needed to maintain populations. The Forest is within the range of seven of these species

Partners in Flight's North American Landbird Conservation Plan (Rich et al. 2004) does not contain a set of requirements that the Forest must follow; the document was used to organize the discussion in this analysis by focusing on those species or habitats that have been identified at a broad scale as being important.

Two documents (USDI Fish and Wildlife Service 2008a and PIF 2000) provide a narrower focused look at key birds and habitats as those documents pertain on a smaller area (a single Bird Conservation Region or State). Again, these documents and the following tables were used as a framework to facilitate the discussion/analysis of migratory landbirds and their habitats by focusing on key species and habitats.

In 2008 the USFWS released a report titled "Birds of Conservation Concern" in which they listed species of concern by Bird Conservation Regions (BCR) (USDI Fish and Wildlife Service 2008a). That report helps focus conservation efforts on the species that need it. The Forest lies within BCR 10 (Northern Rockies). Table 84 lists the species of concern for BCR 10, not all of which are found on the Forest.

Table 84. Birds of Conservation Concern for the Bird Conservation Region that overlaps the Forest (Bird Conservation Region 10 = Northern Rockies)

Common Name	Scientific Name	Is the Forest w/in the Range of Species?*
Bald Eagle	*Haliaeetus leucocephalus*	Y
Black Rosy-Finch	*Leucosticte atrata*	N
Black Swift	*Cypseloides niger*	Y
Brewer's Sparrow	*Spizella breweri*	Y
Calliope Hummingbird	*Stellula calliope*	Y
Cassin's Finch	*Carpodacus cassinii*	Y
Ferruginous Hawk	*Buteo regalis*	Y
Flammulated Owl	*Otus flammeolus*	Y
Lewis's Woodpecker	*Melanerpes lewis*	Y
Loggerhead Shrike	*Lanius ludovicianus*	Y
Long-Billed Curlew	*Numenius americanus*	Y
McCown's Longspur	*Calcarius mccownii*	N
Olive-Sided Flycatcher	*Contopus cooperi*	Y
Peregrine Falcon (b)	*Falco peregrinus*	Y
Sage Sparrow	*Amphispiza belli*	N
Sage Thrasher	*Oreoscoptes montanus*	N
Swainson's Hawk	*Buteo swainsoni*	Y
Upland Sandpiper	*Bartramia longicauda*	Y
White-Headed Woodpecker	*Picoides albolarvatus*	Y
Williamson's Sapsucker	*Sphyrapicus thyroideus*	Y
Willow Flycatcher	*Empidonax traillii*	Y
Yellow-Billed Cuckoo	*Coccyzus americanus*	N

b = breeding

*NatureServe: Explorer http://www.natureserve.org/explorer/index.htm on 9/20/10 or KIPZ MIS Process and AMS Technical Report in the project record; includes accidental, migratory, or transient occurrences

Four of these species are additionally analyzed elsewhere in this document: bald eagle, peregrine falcon, flammulated owl, and olive-sided flycatcher.

The IPNF is within the Partners in Flight Montana Conservation Plan (PIF 2000). These conservation strategies are recommendations to use in management but they are not binding requirements. However, they provide a way to categorize and analyze important migratory bird habitat and species. The use of these plans supports the goal of maintaining long-term sustainability of migratory bird species and their habitats as specified by the Executive Order and Migratory Bird Treaty Act of 1918. The priority habitats and species are listed in table 85.

Table 85. Partners in Flight Priority Habitats/Species for Idaho (PIF 2000)

Partners in Flight Priority Habitats and Species		
Habitat	**Species**	**Is the Forest w/in the Range of Species?[1]**
Riparian	Barrow's goldeneye	Y

Partners in Flight Priority Habitats and Species		
Habitat	**Species**	**Is the Forest w/in the Range of Species?[1]**
	Hooded merganser	Y
	Blue grouse	Y
	Mountain quail	N
	Black-chinned hummingbird	Y
	Calliope hummingbird	Y
	Rufous hummingbird	Y
	Willow flycatcher	Y
	Dusky flycatcher	Y
	Black-billed magpie	Y
	American dipper	Y
	Yellow warbler	Y
	MacGillivray's warbler	Y
Low-elevation Mixed Conifer	Sharp-shinned hawk	Y
	Northern goshawk	Y
	Lewis's woodpecker	Y
	Williamson's sapsucker	Y
	Black-backed woodpecker	Y
	Brown creeper	Y
	Varied thrush	Y
	Townsend's warbler	Y
	Western tanager	Y
Marshes, Lakes, Ponds	Western grebe	Y
	American white pelican	Y
	White-faced ibis	Y
	Trumpeter swan	Y
	Cinnamon teal	Y
	Redhead	Y
	Sandhill crane	Y
	Killdeer	Y
	Black-necked stilt	Y
	American avocet	Y
	Franklin's gull	Y
Sagebrush/Salt Desert Scrub	Swainson's hawk	Y
	Sage grouse	N
	Short-eared owl	Y
	Loggerhead shrike	Y
	Rock wren	Y
	Sage thrasher	N
	Brewer's sparrow	Y
	Lark sparrow	Y

Partners in Flight Priority Habitats and Species		
Habitat	**Species**	**Is the Forest w/in the Range of Species?[1]**
	Sage sparrow	N
High-elevation Mixed Conifer	Olive-sided flycatcher	Y
	Hammond's flycatcher	Y
Grassland	Sharp-tailed grouse	N
	Long-billed curlew	Y
	Grasshopper sparrow	Y
Aspen	Ruffed grouse	Y
Ponderosa Pine	Flammulated owl	Y
	White-headed woodpecker	Y
Juniper/Pinyon/Mountain Mahogany	Ferruginous hawk	N
	Gray flycatcher	N
	Plumbeous vireo	N
	Pinyon jay	N
	Virginia's warbler	N
	Black-throated gray warbler	N
Cliff/Rock Outcrops/Talus	Golden eagle	Y
	Prairie falcon	Y
	Black swift	Y
Cedar and Hemlock	Vaux's swift	Y
Alpine	Black rosy-finch	Y
Lodgepole Pine/Mountain Brush	No High Priority Species Identified	

[1] NatureServe: Explorer http://www.natureserve.org/explorer/index.htm on 9/20/10 or KIPZ MIS Process and AMS Technical Report in the project record; includes accidental, migratory, or transient occurrences

The habitat requirements of the species listed above, as well as range information, can be found online at NatureServe Explorer's database: http://www.natureserve.org/explorer/index.htm. Population estimates can be found on the Partners in Flight online database: http://rmbo.org/pif_db/laped/.

Several of these birds are additionally analyzed elsewhere in the document: dusky flycatcher, black-backed woodpecker, olive-sided flycatcher, Hammond's flycatcher, flammulated owl, and black swift.

Most of the habitats found on the Forest host one or more species of migratory birds. Generally speaking, the birds arrive in the spring to set up territories for breeding purposes. Young are raised and fledged by mid-summer. Most species leave the Forest by mid- to late summer.

Table 86 displays the dominant vegetation types for the IPNF. There is some overlap in categories, and therefore some double-counting. For example, some acres counted as "riparian" would also be counted under the other forested types. Additionally, specific tree species may be found in more than one category, although for the purpose of display they were placed in only one category. Tree species may also be found in several other forest types. For example, aspen is displayed as a separate category, although aspen can be found in smaller quantities scattered throughout the other forested types. The available vegetation data on the Forest was grouped into categories that matched the above listed priority landbird habitats as closely as possible.

Table 86. Dominant Vegetation Type for the IPNF based on FIA Subplots, Vegetation Response Units, VMP Organized to Approximate the PIF Priority Habitats

Dominant Vegetation Type	Estimated % of IPNF 1	Estimated Acres
Low Elevation Mixed Conifer (Douglas-fir, western larch, white pine, yew)	25	616,479
High Elevation Mixed Conifer (whitebark pine, grand fir, subalpine fir, Engelmann spruce, mountain hemlock)	43	1,078,842
Lodgepole Pine	9	228,797
Ponderosa Pine	1	30,188
Cedar/Western Hemlock	13	319,362
Aspen/birch	<1	7,945
Cliff/rock/talus	<1	9,898
Alpine	5	125,746
Waterbodies (lakes, ponds, reservoirs, marsh, swamp, river)	<1	5,356
Grassland	1	23,857
Mtn. brush (shrub)	3	73,837
Riparian (INFISH)	16	392,115

[1] Percentages and acreages do not tally to 100% due to rounding and overlap between some of the categories leading to double-counting

Key Stressors

These stressors can cause habitat loss, displacement, or mortality.

General Stressors:

- Decline in availability of large snags and trees for perching and nesting;
- Fire suppression that results in dense young stands, encroachment of conifers into openings, and loss of open-forest structure;
- Selective timber harvesting with subsequent replanting of closely spaced seedlings;
- Intensive grazing that may remove the shrub and grass understory;
- Alteration or loss of wintering habitat; and
- Wind turbines – mortality on migratory birds.

The following Forest Service management activities may impact migratory birds or their habitat (indirect effects):

- Timber harvest – loss of snags and large trees;
- Fire (both planned ignitions and natural, unplanned ignitions) – removal of standing snags or direct mortality, although fire also maintains open habitat and creates snags;
- Fire suppression – loss of openings and open-forest structure;

- Road maintenance and construction – habitat loss, facilitates firewood harvest, and loss of snags; and
- Recreational use – habitat loss or disturbance.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Fire/Vegetation Management: Fire suppression has degraded habitat for migratory birds. Active fire suppression would be more likely to continue under Alternative A. The action alternatives have more flexibility to use fire to restore/maintain habitat. Dry forest stands that once had more frequent fires and generally had a more open understory now have more ladder fuels than would have been present under natural disturbance. This increases the chance that a large-scale disturbance (e.g., fire, insects) would impact habitat. The Forest is generally lacking ponderosa pine and larch, as shown in FW-DC-VEG-11. In order to move towards historic conditions, as shown in FW-DC-VEG-11, active restoration may need to occur to thin stands before fire can be reintroduced into some ecosystems. Doing so will make those stands more resilient to large-scale disturbance. It will also create and maintain the open habitats that some species use.

All three action alternatives trend vegetation conditions towards desired conditions (FW-DC-VEG-01 through FW-DC-VEG-08, FW-DC-VEG-10, FW-DC-VEG-11, FW-GDL-VEG-03 through 06, and FW-DC-FIRE-03), which are based on historic conditions and natural disturbance processes. Vegetation conditions, under all action alternatives, will be maintained or improved for migratory birds and their habitat in the long-term by creating a more resilient landscape. Although some species would potentially have fewer habitats, the amount and pattern would be similar to what was found under natural disturbance regimes. Fire is a natural part of these habitats, and these birds evolved in its presence. The difference between the alternatives will be primarily how much vegetation treatment will be predicted each year to trend conditions toward the desired conditions for vegetation. Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year). Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives, with 6,000 acres/year of prescribed burning in Alternative A. Of the alternatives, B Modified (1,683 acres) will be expected to have more regeneration treatments per year with constrained budgets in the first decade, followed by C (1,677 acres), D (1,609 acres), and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) will be expected to have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and A (5,537 acres).

Limited progress towards the desired conditions can be made, under constrained budgets; therefore, the use of fire will be more effective at moving towards the desired conditions. Alternative A (current Forest Plan as implemented) is more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire for habitat restoration/maintenance. The use of natural, unplanned ignitions (passive restoration) is more likely in MA1, and Alternative C (335,300 acres) will have the most MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and A (153,900 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

MA direction in the revised Forest Plan that supports expanded use of natural, unplanned ignitions and planned ignitions includes: MA1a-DC-VEG-01, MA1a-DC-FIRE-01, MA1a-GDL-FIRE-01 and 02, MA1b-DC-VEG-01, MA1b-DC-FIRE-01, MA1b-GDL-FIRE-01 and 02, MA1c-DC-VEG-01, MA1c-DC-FIRE-01, MA1c-GDL-FIRE-01 and 02, MA1e-DC-VEG-01, MA1e-DC-FIRE-01, MA1e-GDL-FIRE-01 and 02,MA2a-DC-FIRE-01, MA2a-DC-VEG-01, MA2a-GDL-FIRE-01 through 03, MA2b-DC-VEG-01, MA2b-DC-FIRE-01, MA2b-GDL-FIRE-01 through 03,MA5-DC-VEG-01, MA5-DC-FIRE-01, and MA5-GDL-FIRE-01. This will be useful to maintain/restore migratory bird habitat in the long-term.

GA direction that assists in trending towards the desired conditions for vegetation and fire includes: GA-DC-VEG-CDA-01, GA-DC-VEG-LK-01 and 02, GA-DC-VEG-PO-01 through 03, GA-DC-FIRE-PO-01, GA-DC-VEG-PR-01 through 04, GA-DC-FIRE-PR-01, GA-DC-VEG-SJ-01 through 04, and GA-DC-FIRE-SJ-01.

The increased use of fire, both planned ignitions and natural, unplanned ignitions, would maintain or improve the pattern of migratory bird habitat across the Forest. Managing for the desired conditions for vegetation (historic conditions) will likely result in a pattern of migratory bird habitat similar to what was found historically under natural disturbance processes.

"Perhaps the single greatest challenge for forest managers nationwide is the restoration of fire regimes as a vital component of healthy forest ecosystems. Many forest types, as well as birds and other wildlife of high conservation concern, require natural fire cycles, and a century of unnatural fire suppression has created conditions that are not only harmful to bird populations, but also pose grave economic and safety threats to humans" (NABCI 2011).

Fire can also cause mortality to birds, although most are mobile enough to escape. Timing spring burning to avoid periods when immobile young may be in the nest can reduce this impact. Fire is a natural part of these habitats, and these birds evolved in its presence. FW-DC-WL-15 will maintain a diversity of patch sizes of fire-killed trees to provide wildlife habitat, and FW-GDL-WL-08 will maintain unlogged conditions in some portions of burned areas for 5 years post-fire for those species that need this type of habitat. Allowing fire to play a more natural role in the ecosystem will maintain/restore habitat conditions for several species of birds.

For those species that use mature forests, old growth can contribute to available habitat (FW-STD-VEG-01 and 02, FW-GDL-VEG-01 and 02).

Additional directions in the action alternatives that will benefit members of this group by maintaining or improving habitat include: FW-DC-WL-10 through 15, FW-GDL-WL-08, and FW-DC-GRZ-01.

All of the above direction maintains or improves the habitat components this group uses, including snags, mature forest, openings/edge habitat, and open forest. By trending towards the desired conditions for vegetation and fire, the Forest will provide a similar diversity of habitats and pattern across the Forest as would have been found historically under natural disturbance processes. That means the species in this group will find an amount and arrangement of habitats similar to what they evolved with on the Forest. Additionally, stands will be more resilient to large-scale disturbance (fire, insects, and disease).

Under current management (Alternative A), the percentage of the Forest with high snag densities will increase over the next five decades. The percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 78 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 11 percent in decade 1 to 35 percent in decade 5 with an unconstrained budget and 11 percent to 36 percent with constrained budgets.

For Alternative B Modified, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 81 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 12 percent in decade 1 to 36 percent in decade 5 with an unconstrained budget and 12 percent to 37 percent with constrained budgets.

For Alternative C, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 76 percent in decade 5 with an unconstrained budget and 73 percent to 83 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 12 percent in decade 1 to 37 percent in decade 5 with an unconstrained budget and 12 percent to 39 percent with constrained budgets.

For Alternative D, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will remain steady from approximately 73 percent in decade 1 to 73 percent in decade 5 with an unconstrained budget and increase from 73 percent to 80 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 11 percent in decade 1 to 34 percent in decade 5 with an unconstrained budget and 11 percent to 37 percent with constrained budgets.

The large/very large size class is currently below desired conditions (historic conditions) for stands on the Forest. With unconstrained budgets, there will be an increase in acres in this size class in the next 50 years for Alternatives B Modified (+54,243 acres), C (+51,566 ac), D (+34,730 acres), and A (+10,836 acres). With constrained budgets, there will be an increase in acres in this size class in the next 50 years for Alternatives C (+109,175 acres), B Modified (+102,149 acres), D (+105,372 acres) and A (+83,235 acres). The large/very large size class would remain within HRV.

What this means is that migratory birds will find an increase of stands in the large/very large size class and adequate snags under all alternatives in the next 50 years.

Grazing can reduce the shrub and grass component of open forest stands. This reduces the ground fuels useful to carry the frequent fires that maintain dry forests. It also reduces the understory vegetation component that provides foraging and nesting habitat. FW-DC-GRZ-01 states that grazing will occur at sustainable levels while protecting vulnerable resources.

The above direction in the action alternatives is consistent with the agency's Landbird Strategic Plan (USDA Forest Service 2000). The action alternatives incorporated landbird management (see the direction discussed above – landbird management on the Forest also falls within the "coarse filter" approach to viability discussed in the introduction of this specialist's report). PIF priority birds and habitats were examined during the analysis for the specialist's report. Habitats for landbirds were incorporated into the desired conditions for the revised Forest Plan (again, see the “coarse filter” approach to viability in the introduction – the desired conditions for vegetation and fire are this “coarse filter”). Landbird monitoring has been incorporated as a measurement tool for the revised Forest Plan (see the landbird assemblage MIS).

Access/Disturbance: Alternative A will retain the existing amount of recommended wilderness and non-motorized areas. Large areas with limitations on motorized use can aid in providing security and connectivity. Alternative C (2,129,490 acres motor vehicle) will have the least acreage allowing motor vehicle use, followed by Alternatives B Modified (2,268,390 acres motor vehicle),), D (2,279,590 acres motor vehicle) and A (2,399,138 acres motor vehicle). Alternative C (335,300 acres) would have the most land in MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and Alternatives A (153,900 acres).

MA5 can also contribute to security. Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

Human access can cause individuals of this group to be displaced from the vicinity of the disturbance. This effect will be more common along open roadways as that is where most of the human presence will be concentrated. Additionally, access via open roads facilitates firewood cutting, and results in a loss of snags near roadways. The loss of snags will make the areas around open roads even less desirable for some members of this group. All alternatives will improve access conditions for this assemblage through application of the Access Amendment for grizzly bears. Some roads will be closed and therefore decrease the acreage potentially affected by woodcutting and high human disturbance.

The primary impact from special use permits will likely be disturbance. However, some habitat loss or alteration may also occur. Mineral development could lead to the loss of habitat and increased human presence and therefore disturbance to members of this group in the vicinity of the activities. Individuals may be displaced to habitat elsewhere on the Forest. The footprint of a mine and mill may decrease available habitat by removing live trees and snags. The collection of forest products will result in a loss of habitat and human presence/disturbance that could displace individuals of this group. Firewood cutting in particular will result in a loss of snag habitat along open roadways. The collection of other forest products besides firewood gathering also tends to be associated with open roads due to the ease of access. The snag loss in particular will reduce the suitability of habitat near open roadways for some species in this group. Collection of berries, plants, cones, mushrooms, and other forest products reduces the amount of these items available for foraging by migratory birds. Human presence associated with the collection of forest products could cause disturbance to individual birds and at least temporarily cause them to avoid the area.

Vegetation/fire management activities can also cause short-term disturbance, although there would be long-term habitat improvements/maintenance.

Direction in the revised Forest Plan that will decrease disturbance for various migratory birds includes: FW-DC-WL-01, FW-DC-WL-08, FW-DC-WL-11, FW-GDL-WL-05, FW-GDL-WL-23, and FW-GDL-WL-24.

Additional direction specific to harlequin ducks includes: GA-DC-WL-LK-04 and GA-DC-WL-SJ-03.

Roads can also impact habitats by creating edge, increasing sediment into riparian areas, and through direct loss of habitat within the footprint of the road. FW-DC-AR-07 states that the transportation system will be environmentally compatible.

Cumulative Effects

Please see the "Cumulative Effects Common to Most Species" section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the "Cumulative Effects Common to Most Species" section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past timber harvest, fuels reduction, and fire suppression are the most likely past activities that influenced the amount and distribution of bird habitat on NFS lands. Fire suppression in particular is likely to have changed stand structure and led to encroachment of conifers into natural openings and increased tree densities in formerly open canopied stands. Open roads likely impacted the distribution of snags due to firewood cutting. Road influences have decreased over time as access management has resulted in less routes open to motor vehicle use.

Climate change will have the potential to alter the quantity, quality, and distribution of migratory bird habitats across the Forest. Changes in temperature and precipitation patterns will likely influence vegetation and natural disturbance processes. Combined with past fire suppression and timber management, which has led to less resiliency, there could be an increased risk of large-scale disturbance impacting migratory bird habitat. Active and passive restoration, including utilizing timber harvest and fuels reduction, that trends habitats towards historic conditions and the desired conditions for vegetation will make habitats more resilient to change. This will not only restore/maintain habitats nearer to what was present under natural disturbance processes which migratory birds evolved with, but will make them more resilient and sustainable. Climate change may cause a change in timing of the life-cycle of some insects, consequently altering when prey will be available for migratory birds (page 90 in USDA Forest Service 2010).

All the action alternatives would contribute toward maintaining or improving migratory bird habitat. Timber harvest occurring on private, state, or Canadian lands may impact the distribution, amount, and quality of migratory bird habitat and may impact connectivity between NFS lands. The effects would depend on how many snags are retained, whether habitat that is outside of historic conditions is restored, whether late-successional forests are maintained, and the amount of disturbance to individual birds. The desired conditions for vegetation in the revised Forest Plan would maintain or improve connectivity of habitats on the Forest.

Effects in wintering areas or during migration can reduce populations of the members of this group. Wind turbines, for example, can kill individuals during migration.

Effects Determination

Each of the action alternatives **may impact individuals or habitats** for migratory birds. This determination is based in part on:

- All three action alternatives trend vegetation conditions towards desired conditions (FW-DC-VEG-01 through FW-DC-VEG-08, FW-DC-VEG-10, FW-DC-VEG-11, FW-GDL-VEG-03 through 06, and FW-DC-FIRE-03), which are based on historic conditions and natural disturbance processes. Vegetation conditions, under all action alternatives, will be maintained or improved for migratory birds and their habitat in the long-term, at the very least by creating a more resilient landscape;
- Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), under constrained budgets. Alternative A would treat 10,867 acres/year. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year) and D (10,790 acres/year). Alternative A will treat 11,537 acres/year. Approximately 5,000 acres/year of prescribed burning would be predicted under the action alternatives, with 6,000 acres/year in Alternative A;
- Birds needing openings or early-successional stands will see a decline in those conditions in the next 50 years. The IPNF is currently within the desired conditions for the seedling/sapling size class. However, given current fire suppression levels and predicted vegetation treatments, there will not be enough stand-replacing fire or regeneration harvest to create enough new seedling/sapling size class over the next 50 years. Natural succession will outpace the creation of new seedling/sapling stands. Under unconstrained budgets, Alternative C (-126,731 acres) will have the biggest loss of seedling/sapling size class, followed by Alternatives B Modified (-126,166 acres), D (-123,118 acres), and A (-115,559 acres). Under constrained budgets, Alternative C will have the greatest loss (-128,564 acres), followed by Alternatives B Modified (-122,954 acres), D (-121,102 acres), and A (-114,415 acres). The seedling/sapling size class will move below the desired conditions over the next 50 years for some of the alternatives. If fire is allowed to play a more natural role on the landscape, then the seedling/sapling size class will likely be nearer or within the desired conditions. The revised Forest Plan provides the flexibility to use fire to keep the seedling/sapling size class within HRV;
- Of the alternatives, B Modified (1,683 acres) will be expected to have more regeneration treatments per year under constrained budgets in the first decade, followed by C (1,677 acres), D (1,609 acres), and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) will be expected to have more regeneration treatments per year under unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and A (5,537 acres);
- MA direction in the revised Forest Plan that supports expanded use of natural, unplanned ignitions and planned ignitions includes: MA1a-DC-VEG-01, MA1a-DC-FIRE-01, MA1a-GDL-FIRE-01 and 02, MA1b-DC-VEG-01, MA1b-DC-FIRE-01, MA1b-GDL-FIRE-01 and 02, MA1c-DC-VEG-01, MA1c-DC-FIRE-01, MA1c-GDL-FIRE-01 and 02, MA1e-DC-VEG-01, MA1e-DC-FIRE-01, MA1e-GDL-FIRE-01 and 02,MA2a-DC-FIRE-01, MA2a-DC-VEG-01, MA2a-GDL-FIRE-01 through 03, MA2b-DC-VEG-01, MA2b-DC-FIRE-01, MA2b-GDL-FIRE-01 through 03,MA5-DC-VEG-01, MA5-DC-FIRE-01, and MA5-GDL-FIRE-01. This will be useful to maintain/restore migratory bird habitat in the long-term;
- For those species that use mature forests, old growth can contribute to available habitat (FW-STD-VEG-01 and 02, FW-GDL-VEG-01 and 02); and
- Vegetation/fire management activities can cause short-term effects (e.g., disturbance), although there will be long-term habitat improvements/maintenance.

Big Game

Affected Environment

This group includes mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), moose (*Alces americanus*), elk (*Cervus canadensis nelson),* and mountain goat (*Oreamnos americanus*). These species are generally identified as big game or trophy species where they are hunted. Elk are analyzed in the MIS section and bighorn sheep are analyzed in the "Sensitive Species" section. Montana has a rich tradition of big game hunting, and has earned a well-deserved reputation for having some of the best big game hunting in North America. Big game has high economic and social values and is a large contributor to the quality of life in Montana.

In general, the Forest was used for the analysis area, although in some cases activities occurring on adjacent areas were also evaluated (e.g., cumulative effects). In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes). For some species, habitat is located in discreet pockets (e.g., mountain goat) and was never widespread across the Forest. In those instances, the assessment focused primarily on those areas of known use.

Habitat and Life History Needs

General habitat and life history information comes from www.natureserve.org/explorer.index.htm (NatureServe Explorer).

The following is a summary of the habitat used by each species.

Both species of deer browse on a variety of woody plants and graze on grasses and forbs. They move to areas with less snow in the winter (generally low elevations).

Moose generally browse on woody vegetation or aquatic vegetation. They winter in areas with forested vegetation and summer where there is vegetation for shade or water to aid in cooling.

Mountain goats graze on grasses, forbs, mosses/lichens, and browses on woody vegetation. They are commonly associated with alpine or subalpine areas at or above treeline where cliffs/rocky areas are available for escape and security habitat. Mountain goats may move to areas of lesser snow depths in winter to conserve energy.

Winter range is one of the most important components of big game habitat. Table 87 shows the amount of winter range, on the Forest. The data only gives a rough approximation of the amount of winter range on the Forest due to the scale of the data.

Table 87. Estimated Winter Range Acres on NFS lands

Species	Winter Range (acres) on the IPNF
KIPZ General Winter Range (elk/deer)[1]	415,123

[1] Potential winter range for the KIPZ revision zone based on 1987 Forest Plan MAs, vegetation response units, habitat groups, and ownership, 2004, 1:24000

Table 88 displays the acres within over-snow motorized use closure areas (area closures).

Table 88. Acres Closed to Over-Snow Motor Vehicle Use (may include Winter Range and Non-winter Range

Area Closure	Acres on NFS Lands
12/1-3/31	427
Yearlong	438,896
Total	**439,323**

Table 89 displays the acres of winter range within the area closures. These closure areas are retained in the action alternatives. There is not a large overlap among winter range and the closure areas, which is logical because most snowmobiling occurs at higher elevations that have adequate snow whereas winter range is at lower elevation with less snow.

Table 89. Acres of Winter Range within the Areas Closed to Over-snow Motor Vehicle Use

Species	Winter Range on NFS Lands within Area Closures (% of Winter Range)
KIPZ General Winter Range[1]	30,465 (7%)

[1] Potential winter range for the KIPZ revision zone based on 1987 Forest Plan MAs, vegetation response units, habitat groups, and ownership, 2004, 1:24000

Tables 90 and 91 display the snowmobile use routes and areas that occur outside of the area closures

Table 90. Snow Use Routes Outside of Area Closures*

	Miles on NFS Lands
Snow Use Routes	1,368

* Includes legal groomed snowmobile routes, groomed ski trails, ungroomed routes commonly used by snowmobiles, and outfitter/guide access. This includes routes within winter range and outside of winter range

Table 91. Snow Use Areas Outside of Area Closures*

	Acres on NFS Lands
Snow Use Areas	114,897

* This includes legal known snowmobile play areas and ski areas and does not include illegal snowmobile use. Snow use areas include winter range and non-winter range areas

Tables 92 and 93 display the overlap between winter range, snow use routes, and snow use areas. The overlap of snow use routes and winter range is not large. The acres of snow use areas that overlap winter range is small (5%). If the miles of snow use routes were converted to acres, actual footprint of the routes, the impact would again be small for winter range. If the miles of snowmobile/ski trail routes were buffered to determine the "zone of influence," the impact would still be low (<20 percent of winter range impacted by these routes at a forestwide scale). This assumes a very conservative estimate of effects if all the miles were buffered and the overlapping buffers were not eliminated. These conservative estimates can be arrived at by calculating the acres within the zone of influence and getting a percentage of that "zone of influence" of the total winter range. For example, using a 200 meter buffer on each side for ski trails (the distance recommended in Freddy et al. 1986 to prevent locomotor responses to people afoot), which are more impactful than snowmobile trails, and multiplying by the total miles of routes (regardless of whether they are ski trails or snowmobile routes), the total impact is still no more than 11 percent. Even a very conservative estimate of impacts such as this, which very likely over estimates the extent of impacts, the results are low. If a 350 meter buffer on each side were used instead (the distance where deer showed any response at all, even if they did not move away from the activity, in Freddy et al. 1986), the impact would still be low (19%). This is a coarse-scale, forestwide look at the impacts of snow routes on big game winter range and indicates a low impact forestwide.

Table 92. Miles of Snow Use Routes in Winter Range

Species	Miles of Snow Use Routes on NFS Lands w/in Winter Range
KIPZ General Winter Range[1]	289

[1] Potential winter range for the KIPZ revision zone based on 1987 Forest Plan MAs, vegetation response units, habitat groups, and ownership, 2004, 1:24000

Table 93. Acres of Snow Use Areas in Winter Range

Species	Acres of Snow Use Areas on NFS Lands w/in Winter Range (% of winter range)
KIPZ General Winter Range[1]	21,133 (5%)

[1] Potential winter range for the KIPZ revision zone based on 1987 Forest Plan MAs, vegetation response units, habitat groups, and ownership, 2004, 1:24000

Key Stressors

Forest Service activities that may have direct or indirect impacts on species within this group include:

- Timber harvest which alters the quantity, quality, and placement of cover. Timber harvest, especially with prescribed fire, can increase forage quality and quantity;
- Prescribed fire by itself can also increase forage quality and quantity;
- Fire suppression can reduce the amount of forage, and alter the quantity, quality, and placement of cover;
- Access management, especially motor vehicle access, can be utilized to protect, or, when used in conjunction with hunting, to reduce populations;
- Activities that reduce the amount of security during the big game hunting season; and
- Noxious weeds can also reduce the amount of forage available for big game.

Stressors outside Forest Service control include (cumulative effects):

- The potential spread of chronic wasting disease and other diseases;
- Hunting;
- Vehicle caused mortality;
- Private development, especially in winter range, which can lead to loss of habitat, loss of connectivity, increase in vulnerability (from predators year-round, and during the hunting season);

- The spread of invasive plant species (weeds) can reduce forage values and habitat capacity;
- Severe winters can contribute to high herd mortality;
- Vegetation/fire management on non-NFS lands effect cover/forage; and
- Increased access (roads) on non-NFS lands.

These stressors can result in habitat loss, displacement, or mortality. The stressors that are outside of Forest Service control can result in population changes. Therefore, the population level of big game residing on the Forest is not completely under the control of the Forest.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Vegetation/Fire Management Effects on Cover/Forage: Alternative A is predicted to treat approximately 10,867 acres/year (constrained budget), or 11,537 acres/year (unconstrained budget), including 6,000 acres/year prescribed fire. Active fire suppression would be more likely to continue under Alternative A. The action alternatives have more flexibility to use fire to restore/maintain habitat.

Fire suppression has impacted the vegetation component of habitat for big game. Many areas are outside of historic conditions and in need of active restoration and fuels reduction. If vegetation management is done to move conditions towards historic conditions and the desired conditions for vegetation and fire (FW-DC-VEG-01 through 06, FW-DC-VEG-10 and 11, and FW-DC-FIRE-03), then the vegetation component of big game habitat will be nearer to what would have been present based on natural disturbance processes. Stands will be more resilient to large-scale disturbance and less likely to be lost to fire/insects/disease. The reintroduction of fire into ecosystems can aid in restoring habitat conditions by making stand more resilient (i.e., the use of fire under the right conditions can thin stands while leaving the larger, more resilient trees, thus making the stand more resilient overall to large-scale disturbance). This will reduce the amount of stands with a dense understory. Fire suppression has artificially created cover for big game. Moving towards the desired conditions will trend the amount of cover/forage nearer to conditions that big game evolved with on the Forest, so there will still be adequate cover provided for big game. As stated in FW-DC-FIRE-03, fire plays an increased role in helping to trend vegetation towards desired conditions.

Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year). Approximately5,000 acres/year of prescribed burning is predicted under the action alternatives, with 6,000 acres/year of prescribed burning in Alternative A. Of the alternatives, B Modified (1,683 acres) will be expected to have more regeneration treatments per year with constrained budgets in the first decade, followed by C (1,677 acres), D (1,609 acres), and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) will be expected to have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and A (5,537 acres). Alternative B Modified (5,884 acres) will have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and then A (5,537 acres).

The ERG report (ERG 2012) did not specifically analyze big game habitat, instead it analyzed a dozen other species that represent a variety of habitats on the IPNF, including some that would occupy habitat that would overlap with low-elevation winter range for big game. Although big game were not specifically analyzed, this conclusion from ERG (2012) is important: "…natural disturbances (in the form of wildfire and certain insects and diseases) are projected to have effects on habitat that render the effects of management less than remarkable at the planning scale…Thus, treatments that may have considerable effects at the unit or project scale are lessened in the larger context of the total amounts of wildfire, disease, insects, and succession at the individual national forest or the KIPZ scale" (page E-4 in ERG 2012). This means that the IPNF trends towards the desired conditions for vegetation and fire, but that it is natural disturbance processes that determine that overall amounts and pattern of wildlife habitats across the IPNF, and active management actions such as fuels reduction and timber harvest have little impact at the Forest scale. In general, management had a positive effect on the amount and distribution of habitat for wildlife. Those desired conditions for vegetation and fire are based on historic conditions, natural disturbance processes, and changing climates. The desired conditions are similar to what wildlife, including big game, would have evolved with on the IPNF, so the amount and pattern of big game habitat would be similar to what they evolved with. This includes the amount of winter range, cover, and forage on the IPNF.

Alternative A (current Forest Plan as implemented) is more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire for habitat restoration/maintenance. The use of natural, unplanned ignitions (passive restoration) is more likely in MA1, and Alternative C (335,300 acres) will have the most MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and A (153,900 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

FW-GDL-WL-13 will be applied to reduce the impacts on elk security habitat. Timber harvest can benefit security habitat if it is done to trend towards historic conditions and the desired conditions for vegetation. In doing so, the resiliency of the timbered stand component of security habitat will be improved or maintained and security habitat will be less likely to be lost to a large-scale disturbance (e.g., fire, insects, and disease). Although FW-GDL-13 specifically mentions elk, these security areas will benefit other species as well, including other big game.

Concentrations of livestock can influence big game habitat use. Elk will avoid areas of high livestock use (PNRS 2006), so livestock presence can affect elk use of security areas. Livestock graze on a small proportion of the Forest, so there are many areas free from cattle. Depending on the intensity of grazing, the use of fire can be affected due to the loss of fine ground fuels to carry a fire. Human presence associated with livestock management can also cause disturbance to big game and cause them to avoid those areas. FW-DC-GRZ-01 states that grazing will occur at sustainable levels while protecting resources, so this could aid in reducing impacts from livestock where they are found to be a concern.

Noxious weeds are limited or reduced through FW-DC-VEG-10, and FW-OBJ-VEG-02. This improves forage conditions across the Forest.

Access: Both motorized and non-motorized access can result in disturbance to big game (Ciuti et al. 2012, Canfield et al. 1999, Schultz and Bailey 1978, Freddy et al. 1986, Ward and Cupal 1979). As road densities increase, elk habitat effectiveness decreases (Lyon 1984). In some cases ungulates may react more to a person on foot than a motorized vehicle (Eckstein et al. 1979, Richens and Lavigne 1978, Lavigne 1976). White et al. (2005) found that some animals in Yellowstone can habituate to over-snow motorized use and display little or no reaction unless they are approached on foot. This report by White et al. (2005) suggested that active responses by wildlife can be diminished by restricting over-snow motorized travel to predictable routes and times, reducing the number of vehicles in a group, and other means.

The response of other big game, such as white-tailed deer, to snowmobiling has been studied as well (Dorrance et al. 1975). Depending on where the activity occurs, such as in an area where hunting is allowed versus where it is not, white-tailed deer may habituate to snowmobile use. In areas where hunting is allowed, the deer reacted more to snowmobiles and may not as easily habituate to human (snowmobile) presence (Dorrance et al. 1975).

Some research on the effects of recreation on big game has been conducted at the Starkey Experimental Forest in Oregon. Wisdom et al. (2005) found that off-road activities such as ATV use, hiking, mountain biking, and horseback riding appear to have a “substantial effect on elk behavior” (page 6 in Wisdom et al. 2005). It should be noted that their “off-road” transects included the use of primitive road beds (page 2 in Wisdom et al. 2005). The study did not include an estimate of the energetic costs of the behavioral effects to elk, so it is unclear what the overall effects were to the individual animal or herd health. However, the study does show that the activities studied can impact elk use of habitat due to disturbance/displacement away from the human activities. The reactions of mule deer during the study were not as clear. Deer did not appear to move as much in response to the activities, but they may have been responding by making small behavioral changes such as using dense cover. Naylor et al. (2009) reported similar results for elk from this study on the Starkey Experimental Forest.

Ciuti et al. (2012) is representative of the impacts of recreation on big game on NFS lands. In Ciuti et al. (2012) they found that the “highest levels of vigilance were recorded on public lands where hunting and motorized recreation activities were cumulative compared to the national park during summer, which had the lowest levels of vigilance.” Big game is hunted on the IPNF, so the findings in Ciuti et al. (2012) are relevant. Ciuti et al. (2012) found that elk decreased their feeding time when closer to roads and became more vigilant as traffic volume increased.

The IPNF acknowledges that all types of recreation, whether motorized or non-motorized, can have disturbance impacts on wildlife, including big game. However, most non-motorized users arrive on the IPNF and navigate to their chosen non-motorized recreation spot by driving a motorized vehicle on the IPNF’s road system. Additionally, the number of non-motorized users diminishes with increasing distance from a road. Thus, road access influences the distribution of non-motorized use on the IPNF.

The action alternatives includes direction to minimize disturbance to big game from management activities, with the definition of management activity in the revised Forest Plan being “[a]ny activity that is carried out or authorized by the Forest that would result in impacts on natural resources or change human use of the Forest.” Access management, both motorized and non-motorized, would classify as a management activity because it would have an impact on natural resources (e.g., big game) and change human use on the Forest (the distribution of motorized or non-motorized recreation). Therefore, the revised Forest Plan does include and acknowledge that non-motorized uses may have an impact on wildlife, including big game. Examples of applicable direction in the revised Forest Plan include FW-GDL-WL-11, FW-GDL-WL-12, and FW-GDL-WL-14 which limit disturbance to big game on winter range and during birthing/parturition.

Although FW-GDL-WL-13 and FW-OBJ-WL-02 specifically mention elk, elk security areas also provide security habitat for other wildlife species, including other big game. Therefore, other big game will benefit from the direction provided in FW-GDL-WL-13 and FW-OBJ-WL-02.

Alternative A will retain the existing amount of recommended wilderness and non-motorized areas. Large areas with limitations on motorized use can aid in providing security, areas with low levels of disturbance, and connectivity of big game populations. Alternative C (2,129,490 acres motorized, 1,598,067 acres over-snow motorized) will have the least acreage allowing motorized use, followed by Alternatives B Modified (2,268,390 acres motorized, 1,756,980 acres over-snow motorized), D (2,279,590 acres motorized, 1,759,738 acres over-snow motorized) and A (2,399,138 acres motorized, 1,970,537 acres over-snow motorized). Alternative C (335,300 acres) will have the most land in MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and Alternatives A (153,900 acres).

The grizzly bear Access Amendment is incorporated into all alternatives. The effects will therefore be the same for all alternatives. Implementation will improve security habitat for not only grizzly bears, but for big game as well. FW-DC-AR-06, although directed at providing people solitude and non-motorized experiences in remote settings, will maintain/create areas that may function as security habitat for big game. FW-DC-WL-02 states that a forestwide system of large remote areas will be maintained/ or created, and these areas could function as security habitat for big game as well. Although people may still recreate in non-motorized areas, the likelihood of disturbance to big game will be lower and therefore security will be greater.

Special use permits/lands can affect the amount and quality of big game security habitat. Anything that changes motorized route locations or densities can change security habitat. Special use permits that do not change motorized routes can still affect security by increasing human presence within security areas and thereby changing the quality of those habitats.

Mineral activities can reduce the amount of big game security habitat. The footprint of the mine/mill can remove security habitat, as can the haul/supply route. Not only can the footprint of these facilities remove habitat, but the increased disturbance can affect nearby habitat.

The collection of forest products primarily occurs near open roads. Any collection that occurs away from open motorized routes may cause disturbance to big game in security habitat. However, the effects are expected to be minor because most collecting occurs near open roads.

FW-GDL-WL-13 will minimize disturbance, along with FW-GDL-WL-11, 12, and 14.

Most snowmobiling occurs at higher elevations, which places it above most of the big game winter range on the Forest. The direction in the revised Forest Plan, including area closures for over-snow motorized use, will reduce the impacts on winter range over that of the existing 1987 Forest Plan, which already minimized the effects to big game winter range. The acres available to over-snow motorized use diminishes in Alternative B Modified and Alternative C, over that of Alternative A. Livestock do not occur over much of the IPNF, but their impacts would be minimized through FW-DC-GRZ-01.

Table 94. Acres of Areas Closed to Over-Snow Vehicle Use by Alternative

Alternative	Forest Service Acres
A	438,550

Alternative	Forest Service Acres
B Modified	524,351
C	659,919
D	520,161

As shown in the table 94, the acres of area closures where over-snow motorized use not be allowed varies by alternative. The changes are mainly due to the acres in recommended wilderness. As expected, Alternative C has the most acres of area closures as it has the most acres of recommended wilderness.

The amount of snow use routes and snow use areas outside of area closures are shown in tables 95 and 96. The miles of snow use routes and snow use areas do not vary much by alternative.

Table 95. Miles of Snow Use Routes Outside of Area Closures

Alternative	Forest Service Miles
A	1,368
B Modified	1,367
C	1,361
D	1,367

Table 96. Acres of Snow Use Areas Outside of Area Closures

Alternative	Forest Service Acres
A	114,897
B Modified	114,697
C	104,319
D	114,828

Table 97 displays the acres of winter range within area closures by alternative.

Table 97. Acres of Winter Range within the Areas Closed to Over-snow Motor Vehicle Use (closure areas) for the Action Alternatives

Alternatives	Winter Range[1] on NFS Lands within Area Closures (% of winter range)
B Modified	32,210 (8%)
C	45,965 (11%)
D	31,825 (8%)

[1] Potential winter range for the KIPZ revision zone based on 1987 Forest Plan MAs, vegetation response units, habitat groups, and ownership, 2004, 1:24000

Tables 98 and 99 display the overlap of snow use routes and snow use areas with winter range by alternative.

Table 98. Overlap (miles) of Snow Use Routes and Winter Range for the Action Alternatives

Alternatives	Miles of Snow Use Routes on NFS Lands w/in Winter Range[1]
B Modified	289
C	288
D	289

[1] Potential winter range for the KIPZ revision zone based on 1987 Forest Plan MAs, vegetation response units, habitat groups, and ownership, 2004, 1:24000

Table 99. Overlap (acres) of Snow Use Areas and Winter Range for the Alternative B Modified

Alternatives	Acres of Snow Use Areas on NFS Lands w/in Winter Range[1] (% of winter range)
B Modified	21,133 (5%)
C	21,129 (5%)
D	21,133 (5%)

[1] Potential winter range for the KIPZ revision zone based on 1987 Forest Plan MAs, vegetation response units, habitat groups, and ownership, 2004, 1:24000

There is very little difference among the alternatives regarding impacts to winter range from snow use areas and routes. All the action alternatives are very similar to the existing condition. As discussed above in the existing condition section, the impacts from the existing snow use routes and areas on winter range is very small. Therefore, because the action alternatives have very similar effects as the existing condition, there will be very little impact to winter range under any of the alternatives. Given the direction in the action alternatives to minimize impacts on winter range coupled with the already very small impact on winter range, it is clear that the revised Forest Plan is more than adequate to protect winter range. This coarse-scale forestwide look at the impacts revealed that the effects are small at this level of analysis. The direction in the revised Forest Plan to minimize effects to winter range where an overlap with over-snow use does occur provides added assurance that effects can be kept minimal at all scales within the Forest.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past management on NFS lands, particularly access management, likely impacted the amount and location of security habitat on the Forest. Access management has trended towards reducing the amount of motorized routes on the Forest over time. Timber management, fuels reduction, and fire suppression have impacted the amounts and pattern of forage/cover for native ungulates on the Forest. Fire suppression in particular likely had the greatest influence. It likely led to the encroachment of conifers into natural openings and limited the creation of new openings that would provide foraging habitat.

Timber harvest and fuels reduction occurring on private, state, or Canadian lands may impact the distribution, amount, and quality of big game habitat and may impact connectivity between NFS lands. Activities on other land ownerships may degrade or improve ungulate habitat, particularly winter range on private lands. If timber harvest and fuels reduction are done to move conditions nearer to those present under natural disturbance processes, then ungulate habitat will be maintained/improved. However, if conditions are not maintained or restored to those found under natural disturbance processes, winter range can be degraded. Subdivision of winter range on private lands can lead to loss of winter range for native ungulates. Fuels reduction near these homes has the potential to degrade winter range, as discussed above. The desired conditions for vegetation in the revised Forest Plan will maintain or improve not only security habitat on the Forest, but also cover/forage for native ungulates. Vegetation management that trend towards historic conditions and the desired conditions for vegetation on the Forest will move conditions nearer to what would have been present under natural disturbance processes. Therefore the amount and pattern of ungulate habitat, including winter range, on the Forest will be similar to conditions that ungulates evolved with under natural disturbance processes.

Climate change may have an impact on vegetation and therefore the timber stand component of security habitat as well as forage/cover. Past fire suppression has increased stand densities and decreased the resiliency of some stands to large-scale disturbance (fire, insects, and disease). Climate change may increase the likelihood of large-scale disturbance. However, moving stand conditions towards historic conditions and the desired conditions for vegetation will decrease stand densities and increase their resiliency to large-scale disturbance. Habitat conditions will be nearer to what will be present under natural disturbance processes, which includes the pattern and amount of forage/cover for big game. The vegetation component of habitat for big game will be nearer to what was present historically, and will be more resilient to large-scale disturbance and the impacts of climate change. Climate change may alter big game use of winter range, as well as change the timing of movements between seasonal ranges (page 92 in USDA Forest Service 2010).

Any construction of roads on other land ownerships, as well as subdivision and development, may decrease security habitat not only on those lands, but also on the immediately adjacent NFS lands.

Private land development and increased road densities or increased use of existing roads can impact connectivity. Vehicle-ungulate collisions can cause direct mortality to big game as well.

Hunting, managed by the state, can impact big game populations. Depending on the management goals, hunting regulations can lead to decreasing, increasing, or stable populations. Diseases, such as chronic wasting disease, can also impact big game populations and cause a decline. Severe weather can impact herds and cause a decline.

Effects Determination

Each of the action alternatives **may impact** big game and their habitat. This determination is based in part on:

- Based on FW-GDL-WL-13, security habitat for elk will be maintained or increased. These areas not only provide security for elk, but also for other wildlife species such as big game;

- Wilderness areas (MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01), IRAs, and other non-motorized areas (FW-STD-WL-02, FW-GDL-WL-13, MA3-DC-WL-01, and MA5-DC-WL-01) contribute to secure habitat and connectivity for big game;
- Additional direction within the revised Forest Plan that contributes to habitat for big game includes: GA-DC-WL-CDA-02; and GA-DC-WL-SJ-01. These either specifically mention maintaining security habitat for big game within specific GAs, or would decrease disturbance or maintain the vegetation components of big game habitat;
- During the winter period, FW-GDL-WL-11 and 12 are designed to minimize or avoid disturbance to big game on winter ranges, and FW-GDL-WL-14 reduces disturbance on calving areas. The impact on winter range will be lessened under Alternatives B Modified and C compared to the existing conditions. The existing 1987 Forest Plan already had direction that protected winter range, and the revised Forest Plan would diminish the areas available to over-snow motor vehicle use even more; and
- Habitat for native ungulates will be managed in coordination with state agencies, with cover/forage managed based on the desired conditions for vegetation in the revised Forest Plan (FW-DC-WL-17). The desired conditions are based on natural disturbance processes, and big game will have the amounts and pattern of habitat similar to the conditions they evolved with on the Forest as conditions trend towards the desired conditions.

Connectivity

Affected Environment

Connectivity was evaluated as several scales. First, the effects of action alternatives on connectivity within blocks of NFS lands were evaluated. Secondly, the effects of the action alternatives on connectivity *between* blocks of NFS lands were evaluated. Thirdly, the cumulative effects analysis evaluated the intermixture of effects of the action alternatives and activities on adjacent lands on connectivity. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Connectivity is the arrangements of habitats that allow organisms and ecological processes to move across the landscape. Connectivity benefits wildlife populations by allowing genetic interchange, allowing individuals to find new territories, allowing populations to expand into currently unoccupied habitat, counteracting habitat fragmentation/isolation, allowing species to respond to climate change, and reducing mortality (e.g., reduced roadkill) (Crooks and Sanjayan 2006, Hilty et al. 2006, Morrison et al. 2002).

The IPNF is contiguous with the Kootenai National Forest to the east, Canada to the north, the Colville NF to the west, and the Clearwater NF to the south. Wildlife and natural ecosystem processes occur irrespective of political boundaries. On the IPNF, connectivity of vegetation has been influenced to varying degrees by road construction, ski area development, timber harvest, fire, utility corridors, and land ownership. Construction of primary roads (maintenance level 3 through 5) has reduced connectivity of patches to some degree. In addition, roads may also serve as dispersal routes for some wildlife and plant species. Major transportation corridors through the Forest are State Highways 3, 57, and 200; U.S. Highways 2, 10, 95 and 95-A; and Interstate 90. The Union-Pacific, Burlington Northern, Milwaukee, Potlatch and Spokane International Railroads cross the Forest as well.

There is one small ski area on the IPNF (Lookout Pass) with no likely addition of other ski areas. This ski area has had minimal impacts on connectivity or patch size due to its small size.

Utility corridors can impact connectivity and increase the amount of edge created. There are a number of existing communication lines, transmission lines, and oil and gas pipelines crossing the Forest (Plan, pages IV-40 to IV-41).

Land ownership and the associated management of it can also have an effect on connectivity. Land managed to differing intents can create more edge or affect patch size. Private development, especially in winter range, can lead to a loss of connectivity.

The 1987 Forest Plan projected that 176 miles of new roads would be constructed each year and 97 miles would be reconstructed. Table 100 summarizes the number of miles of road construction and reconstruction that actually occurred from 1988 through 2009.

Table 100 shows that the projected amount of annual new road construction (176 miles) was much greater than the amount that actually occurred for every year from 1988 to 2009. For road reconstruction the amount projected (97 miles) was exceeded for 13 of the 22 years. Road reconstruction generally occurs on older roads and is necessary to bring them up to standards so they are drivable.

Table 100. Miles of Road Construction and Reconstruction, by Fiscal Year, for the IPNF (1988-2009)

FY	Miles of Construction	Miles of Reconstruction	FY	Miles of Construction	Miles of Reconstruction
1988	103	233	1999	5	74
1989	134	130	2000	2	373
1990	83	140	2001	3	<1
1991	46	107	2002	1	24
1992	65	109	2003	4	64
1993	57	233	2004	7	172
1994	2	43	2005	0	838
1995	12	54	2006	6	232
1996	1	41	2007	5	53
1997	16	202	2008	0	76
1998	12	276	2009	2	111

The importance of connectivity has been addressed in various recovery plans (grizzly bear (1993), woodland caribou (1985, updated in 1994)), the Interagency Grizzly Bear Guidelines [1986], various biological opinions, and the Northern Rockies Lynx Management Direction (2007).

Several analyses (Servheen et al. 2003, American Wildlands 2008, Ruediger and Lloyd 2003, Mattson and Merrill 2004) have been conducted by various entities, including federal and private, to address connectivity. The Washington Wildlife Habitat Connectivity Working Group produced a report in 2010 examining connectivity in Washington, as well as part of Idaho and Montana (WWHCWG 2010). This includes connectivity between the IPNF, KNF, and the Colville NF in Washington. The Forest reviewed the various analyses that have been completed and conducted an analysis of forest conditions in relation to providing for wildlife movement within and across the Forest. Management areas such as wilderness and others (recommended wilderness, wilderness study area, inventoried roadless areas) that allow for limited motorized route densities and have low levels of development are considered to provide higher quality habitats for such use.

Backcountry or semi-primitive motorized/non-motorized (MAs 10 and 20 in the existing Forest Plan) areas are generally without roads. These areas vary in size (MA10 consists of blocks of 2,500 acres or more and MA20 consists of blocks up to 1,700 acres (Plan, page III-84)) and management activities are generally less intensive, less frequent, and less visible than management activities in other MAs. Few improvements, with the exceptions of trails, are provided. Higher levels of wildlife security are provided and water quality and aquatic health are normally good to excellent within these areas.

Table 101. Existing Acres (1987 Plan as implemented) of Management Areas 10,11, and 20

Management Area	Description	Existing Acres
10	Semi-primitive Recreation	125,100
11	Existing and Proposed Wilderness	153,900
20	Semi-primitive unroaded with limited timber harvest	65,500

There are 45 Inventoried roadless areas (IRAs) on the IPNF, which accounts for 32 percent of the land base. In addition, the IPNF administers four IRAs w/in the Idaho state boundary (35,100 acres) (Roadless Area Conservation FEIS appendix C Volume 3, 2008).

The AMS documented how traditional timber harvest strategies had substantially changed the Forest from historical conditions. The range of patch sizes was significantly smaller following harvest activities and post-harvest conditions were often similar. While prescribed fire has the potential to approximate certain natural ecological conditions and processes, it is often applied on a much smaller scale and with less variability in severity than fires.

There has been a significant reduction in the overall number of fires compared to historical conditions, although in recent decades the acres contained in large fires has increased and become more variable. Low and mixed-severity wild fires have essentially been eliminated as a significant disturbance process. Most high-severity fires have also been successfully suppressed. It has been recognized, however, that the overall suppression of unplanned ignitions has increased fire risk in certain forest types, producing unusually severe effects, particularly in drier forests. The suppression of fires has contributed to the overall effect of changes in landscape pattern (more homogeneity across the landscape), and changes in species composition (i.e., increases in species that are shade tolerant, fire and drought intolerant, and trees that are more susceptible to insects and disease).

Interrelated with the suppression of fires, was the associated change in insect and disease activities that have occurred. Insects and diseases are now the dominant disturbance process on the IPNF. Particularly susceptible are those trees that have benefited from fire exclusion – shade tolerant/drought and fire intolerant species. Certain insects/diseases that historically thinned the forest at regular intervals now occur as stand replacing disturbances (e.g., root diseases and Douglas-fir bark beetles). Furthermore, white pine blister rust has substantially reduced the amount and changed the age-class structure of five needle pines (i.e., western white pine and whitebark pine) throughout the Forests.

Connectivity can take several forms, from linear corridors, to stepping stones of suitable habitat, to managing the landscape as a whole so that movement is facilitated without the need for a "corridor." Connectivity is species specific, and what is considered homogenous habitat for a wide-ranging carnivore can be heterogeneous for a small mammal (pages 164-166 in Morrison 2002).

High-volume roads can create a barrier that degrades habitat connectivity. These roads can cause mortality, prevent movement, change habitat near the roadway, and alter animal behavior (pages 505-506 in Clevenager and Wierzchowski 2006). Forman et al. (2003) states that roads can be barriers to movement for a species and can "…result in higher mortality, lower reproduction and, ultimately, smaller populations and lower population viability" (page 129 in Forman et al. 2003).

Low traffic volume roads in remote areas, such as many roads on NFS lands generally have lesser effects than high-volume roads. Forman et al. (2003) states, "The effects of vehicles in remote areas are somewhat limited because of the low road density and sparse traffic. Wildlife may be habituated to the possible disturbance caused by passing vehicles. The roads are permeable for crossing by most animals and thus have little effect on movement patterns except in locations where human development and road density are relatively great. Wildlife collisions with vehicles are usually not a problem, in part due to low vehicle speeds. Noteworthy exceptions are where animals such as reptiles are attracted to the road surface, particularly at night" (page 355 in Forman et al. 2003).

As described in Hilty et al. 2006, "Connectivity is determined 1) by the distances between patches relative to an organism's ability to travel, 2) by the quality of the patches themselves, 3) by the hospitality of the matrix that must be traversed, and 4) by the presence of corridors or paths of less resistance for these movements" (page 146 in Hilty et al. 2006).

Key Stressors

Impacts to connectivity include those that affect the distribution, pattern, quality, and quantity of habitat, as well as the human presence/disturbance influence on an animal's ability to move through and use that habitat.

Stressors that are under Forest Service control include:

- Vegetation/Fire management (timber harvest, fuels reduction, fire suppression, noxious weeds, grazing, etc.); and
- Access/Disturbance.

Stressors that are outside of Forest Service control includes:

- Vegetation/Fire management on non-Forest Service ownerships;
- Access/Disturbance on non-Forest Service ownerships;
- Private land development; and
- Climate Change.

Environmental Consequences

Effects Related to Key Stressors under Forest Service Control

Vegetation/Fire Management: Active fire suppression would be more likely to continue under Alternative A. The action alternatives have more flexibility to use fire to restore/maintain habitat.

Attaining the desired conditions for vegetation will have a large impact on connectivity. As discussed above, native species will have similar amounts of connectivity habitats as found historically under natural processes if the desired conditions for vegetation are achieved. This is based on the assumption that native species evolved with the natural processes; and therefore, if habitats are restored/maintained near historical conditions and natural processes are allowed to function with less restriction, then wildlife has the amounts and arrangement of habitats more closely approximating what they had historically.

The more fire is allowed to play a more natural role; the closer the amount and distribution of habitats will be to what would have been present historically. Fuels reduction can also aid in restoring habitat (connectivity) for native species when it is compatible with the desired conditions for vegetation. In close proximity to homes, if fuels reduction is not done to meet the desired conditions for vegetation, then connectivity can be degraded for some species. Allowing fire to play a more natural role in these ecosystems through implementation of FW-DC-FIRE-03 will be useful for maintaining and restoring the vegetation component of connectivity that native species evolved with in these ecosystems.

Timber management can have a large impact on the amount and arrangement of connectivity available for species. Where timber management will be used as a tool to achieve the desired conditions for vegetation, then connectivity can be moved towards the arrangement and amounts that would have been present historically under natural disturbance processes.

All three action alternatives trend vegetation towards desired conditions (FW-DC-VEG-01 through FW-DC-VEG-08, FW-DC-VEG-10 and 11, FW-STD-VEG-01 and 02, FW-GDL-VEG-01 through 06, and FW-DC-FIRE-03), which are based on historic conditions and natural disturbance processes. The difference between the alternatives is primarily how much vegetation treatment will be predicted each year to trend conditions toward the desired conditions for vegetation. Alternative C (11,031 acres/year) will have the most active restoration followed by Alternatives B Modified (9,465 acres/year), D (7,912 acres/year), and A (10,867 acres/year) under constrained budgets. With an unconstrained budget, Alternative B Modified (14,190 acres/year) will have the most active restoration followed by Alternatives C (13,195 acres/year), D (10,790 acres/year), and A (11,537 acres/year). Approximately 5,000 acres/year of prescribed burning will be predicted under the action alternatives, with 6,000 acres/year of prescribed burning in Alternative A. Of the alternatives, B Modified (1,683 acres) will be expected to have more regeneration treatments per year with constrained budgets in the first decade, followed by C (1,677 acres), D (1,609 acres), and then A (1,474 acres). Of the alternatives, B Modified (5,884 acres) will be expected to have more regeneration treatments per year with unconstrained budgets in the first decade, followed by C (5,842 acres), D (5,790 acres), and A (5,537 acres).

Given the predicted amounts of harvest, active restoration will have little impact on habitat pattern at the Forest scale compared to the potential impacts of fire use. The use of natural, unplanned ignitions (passive restoration) will have a much greater likelihood of maintaining or improving habitat pattern across the Forest. Alternative A (current Forest Plan as implemented) is more likely to result in continued suppression of most fires and therefore less passive restoration/maintenance of habitat pattern. The action alternatives have more flexibility to use fire for habitat restoration/maintenance. The use of natural, unplanned ignitions (passive restoration) is more likely in MA1, and Alternative C (335,300 acres) will have the most MA1, followed by B Modified (188,700 acres), and D (156,800 acres), and A (153,900 acres equivalent to MA1). Fire may also be used more in MA5 compared to MA6, and Alternatives B Modified (681,200 acres) and C (630,000 acres) have more than D (624,900 acres).

MA direction in the revised Forest Plan that supports expanded use of natural, unplanned ignitions and planned ignitions includes: MA1a-DC-VEG-01, MA1a-DC-FIRE-01, MA1a-GDL-FIRE-01 and 02, MA1b-DC-VEG-01, MA1b-DC-FIRE-01, MA1b-GDL-FIRE-01 and 02, MA1c-DC-VEG-01, MA1c-DC-FIRE-01, MA1c-GDL-FIRE-01 and 02, MA1e-DC-VEG-01, MA1e-DC-FIRE-01, MA1e-GDL-FIRE-01 and 02,MA2a-DC-FIRE-01, MA2a-DC-VEG-01, MA2a-GDL-FIRE-01 through 03, MA2b-DC-VEG-01, MA2b-DC-FIRE-01, MA2b-GDL-FIRE-01 through 03,MA5-DC-VEG-01, MA5-DC-FIRE-01, and MA5-GDL-FIRE-01. This will be useful to maintain/restore connectivity in the long-term.

Further direction in the action alternatives that will contribute to providing habitat for a variety of species and contributing to connectivity, including species that may use snags, downed wood, burned habitat, old growth, and riparian/aquatic habitats, includes: FW-DC-TBR-01, FW-DC-TBR-03, FW-GDL-TBR-01, FW-DC-GRZ-01, and most of the direction in the “Watershed, Soil, Riparian, and Aquatic Resources” section.

Under current management (Alternative A), the percentage of the Forest with high snag densities will increase over the next five decades. The percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 78 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 11 percent in decade 1 to 35 percent in decade 5 with an unconstrained budget and 11 percent to 36 percent with constrained budgets.

For Alternative B Modified, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 75 percent in decade 5 with an unconstrained budget and 73 percent to 81 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 12 percent in decade 1 to 36 percent in decade 5 with an unconstrained budget and 12 percent to 37 percent with constrained budgets.

For Alternative C, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will increase from approximately 73 percent in decade 1 to 76 percent in decade 5 with an unconstrained budget and 73 percent to 83 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 12 percent in decade 1 to 37 percent in decade 5 with an unconstrained budget and 12 percent to 39 percent with constrained budgets.

For Alternative D, the percentage of the Forest with 10+ snags/acres in the 10"-20" dbh range will remain steady from approximately 73 percent in decade 1 to 73 percent in decade 5 with an unconstrained budget and increase from 73 percent to 80 percent with constrained budgets. The percentage of the Forest with 4+ snags/acres in the >20" dbh range will increase from approximately 11 percent in decade 1 to 34 percent in decade 5 with an unconstrained budget and 11 percent to 37 percent with constrained budgets.

The large/very large size class is currently below desired conditions (historic conditions) by approximately 221,900 acres on the Forest. With unconstrained budgets, there will be an increase in acres in this size class in the next 50 years for Alternatives B Modified (+54,243 acres), C (+51,566 acres), D (+34,730 acres), and A (+10,836 acres). With constrained budgets, there will be an increase in acres in this size class in the next 50 years for Alternatives C (+109,175 acres), B Modified (+102,149 acres), D (+105,372 acres) and A (+83,235 acres). The large/very large size class would remain within HRV.

The GA direction is suited for the dynamic habitats found on the IPNF and is compatible with the desired conditions for vegetation and fire found in action alternatives. As the example using marten and flammulated owl habitat in the ERG report (ERG 2012) shows, the action alternatives will provide connectivity within and through the IPNF and is better than having static, inflexible, mapped polygons that are incompatible with the IPNF's dynamic natural disturbance processes. Additionally, because there are currently no crossing structures existing or planned across highways that cut through the IPNF, nor are there any multi-agency/landowner agreements to manage connectivity within or adjacent to the IPNF's boundary, the flexible nature of the GA and forestwide direction allows the IPNF to manage connectivity in the future if multi-agency/landowner efforts result in the development of such structures or agreements to manage connectivity.

The flexible connectivity direction found in the GA and forestwide sections of action alternatives is more compatible with the dynamic habitats and natural disturbance processes on the IPNF than static, inflexible, permanent mapped polygons. What exists today for connectivity may change in the future due to natural disturbance processes. Connectivity, like habitat components, is species specific. There may be some commonalities among a group of species, but there are also some incompatibilities. Connectivity for wet forest species is different than connectivity for dry forest species. A map for mature, wet-forest habitat connectivity will only be a snap-shot in time. If a fire altered habitat over a large-scale, then that map may be obsolete. Therefore, the action alternatives did not use static, inflexible, permanent, and snap-shot in time mapped polygons to manage connectivity. It used the flexible connectivity direction in the GA and forestwide sections to provide connectivity for species on the IPNF. The IPNF's concept for connectivity is similar to the IPNF's concept for the desired conditions for vegetation and fire. The habitats, and connectivity, on the IPNF are dynamic and reflective of natural disturbance processes. Managing for the desired conditions for vegetation and fire in the action alternatives, combined with the connectivity direction in the GA and forestwide sections of the revised Forest Plan, will provide the habitats and connectivity similar to the conditions species on the IPNF evolved with under natural disturbance processes.

Grazing can impact connectivity through alteration of vegetation communities, although this impact will be small on the IPNF because of the limited grazing opportunities. Grazing can reduce the amount of forage available for native wildlife, the presence of livestock can cause wildlife to avoid the area, and the presence of grazing permittees or their employees can cause disturbance to wildlife.

Access/disturbance: Access will be one of the biggest impacts on connectivity, in particular for those species that are sensitive to human disturbance. The Access Amendment for grizzly bears, which applies to all alternatives, reduced road densities and will over time improve conditions for a variety of species.

Alternative A will retain the existing amount of recommended wilderness and non-motorized areas. Large areas with limitations on motorized use can aid in connectivity of wildlife populations. Alternative C (2,129,490 acres motor vehicle use, 1,598,067 acres over-snow motorized) would have the least acreage allowing motorized use, followed by Alternatives B Modified (2,268,390 acres motor vehicle use, 1,756,980 acres over-snow motorized), D (2,279,590 acres motor vehicle use, 1,759,738 acres over-snow motorized) and A (2,399,138 acres motor vehicle use, 1,970,537 acres over-snow motorized). Alternative C (335,300 acres) would have the most land in MA1, followed by Alternatives A (153,900 acres), B Modified (188,700 acres), and D (156,800 acres).

Additional direction in the action alternatives that aid in some way in providing security habitat or areas with lower disturbance that can contribute to connectivity include: FW-DC-AR-06 and 07, FW-DC-WL-02 through 05, and FW-STD-WL-02.

The desired condition (FW-DC-WL-18) will be for the IPNF to work cooperatively with other agencies when there is a proposal to build or improve highways bisecting the IPNF. When crossing structures are part of those highway projects, then human activities on the IPNF will not prevent wildlife from using those crossing structures. Structures will facilitate wildlife movement across the highways and reduce the risk of vehicle caused mortality.

The management of IPNF lands near future crossing structures is the same for all action alternatives (FW-DC-WL-18, FW-GDL-WL 15 through 17). The IPNF does not have control over exactly where and when crossing structures are built for highways because those highways are under another agency's jurisdiction. The IPNF must work cooperatively with those other agencies, land owners, and organizations in the development of crossing structures when highway construction or reconstruction would be proposed on roads that bisect IPNF lands. This direction aids in maintaining or improving connectivity between blocks of NFS lands, whereas the direction that influences the vegetation aspect of connectivity, provides lower disturbance, or increased security on NFS lands additionally improves or maintains connectivity within the Forest.

GA direction that will be specifically directed at maintaining/improving connectivity includes: GA-DC-WL-CDA-03, GA-DC-WL-LK-01 and 02, GA-DC-WL-PO-01, GA-DC-WL-PR-01 and 03, and GA-DC-WL-SJ-02. Every GA will have direction related to connectivity. Combined, this direction provides connectivity within the Forest as well as connectivity to forests west, south, and east, and Canada to the north.

Wilderness areas (MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01, MA1e-DC-WL-01), IRAs, and other non-motorized areas (FW-STD-WL-02, MA3-DC-WL-01, and MA5-DC-WL-01) contribute to secure habitat and connectivity for some species. These areas are generally in more rugged terrain that was historically difficult to log and therefore no roads were built there. These areas also have less human disturbance because of the limits on motorized use (MA1a-STD-AR-02 and 04, MA1b-STD-AR-01, MA1b-STD-AR-03 and04, MA1c-STD-AR-02 and 03, MA1e-STD-AR-02 and 03).

Special uses can reduce the amount of habitat available and disrupt connectivity (e.g., ski area), or the human disturbance associated with special uses can cause wildlife to avoid an area and thereby disrupt connectivity. The impact may increase as human populations increase and demand on IPNF lands increase, and special uses may become a larger contributor to fragmentation in the future. The desired condition that management activities not prevent wildlife from utilizing future wildlife crossing structures will allow connectivity to be maintained or improved in the future with regard to special uses near key barriers to movement such as highways and railroads.

Mineral exploration and mining activities can have impacts on connectivity. Not only may there be a loss of habitat at the mine site itself, but the human activity and noise may deter wildlife from using the immediate vicinity. Additionally, the haul/supply route may necessitate the construction of a new road. Traffic volumes along the haul/supply route may be great enough to create a new barrier to wildlife movement. This impact may be reduced under the action alternatives due to the desired condition for wildlife that includes high use Forest roads as those to be considered for wildlife crossing structures when those roads are constructed or reconstructed.

There may be some small habitat changes due to the collection of forest products. Human presence may also impact connectivity when the permit holders are present to collect the forest products. Generally, the impact of human presence for forest product collection would be expected to be less that the disturbance caused by the recreating public.

Grazing can reduce the amount of forage available for native wildlife, the presence of livestock can cause wildlife to avoid the area, and the presence of grazing permittees or their employees can cause disturbance to wildlife. However, there are few remaining active allotments on the Forest and therefore the effect is not expected to be large. FW-DC-GRZ-01 will also minimize impacts.

Cumulative Effects

Please see the “Cumulative Effects Common to Most Species” section at the end of this wildlife analysis for additional information. What are found below are the cumulative effects that were too unique to the species to group into the “Cumulative Effects Common to Most Species” section.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past timber harvest, fuels reduction, and fire suppression likely influenced the pattern of connectivity of habitats on NFS lands. Fire suppression in particular likely changed the patch size and arrangement of different habitats on the landscape. It has led to the encroachment of conifers into natural openings and an increase in tree densities within formerly open canopied stands. Access management has trended towards reducing the amount of motorized routes on the Forest over time and this has likely altered connectivity for species sensitive to human disturbance. Developments on NFS lands, such as mines, recreation facilities (e.g., campgrounds), and special uses also potentially influenced how certain species that are sensitive to human disturbance move through specific areas.

Timber harvest/fuels reduction efforts are possible on all land ownerships, in particular where they are near residences. If these are done in such a way that they restore habitat that has been degraded by fire suppression, then connectivity can be improved. If not, then connectivity can be lost for some species.

Climate change will affect the vegetation component of connectivity. As the climate changes and the amounts and distribution of different habitats on the IPNF changes, then connectivity will be changed. The exact amounts and distribution of future habitats is hard to predict, but it can be assumed that some species may see improved connectivity while others may become more isolated. Climate is just one of many variables that determine what kinds of habitat are present on any particular site, and future habitats may be different than what was available historically or currently (Lo et al. 2010). Distributional shifts are one way species respond to climate change, and connectivity is important in determining how well species respond to climate change (pages 90-93 in USDA Forest Service 2010). Many adaptation opportunities (pages 92-93 in USDA Forest Service 2010) have been woven into the action alternatives. Not all of the potential ideas/opportunities are appropriate or compatible with the conditions on the Forest. Some of those that are compatible and have been woven into the action alternatives include preventing/controlling invasives, using fire to maintain ecosystems, maintaining healthy/connected/genetically diverse populations, promoting connected landscapes, and managing for resilience by reducing stressors and maintaining disturbance processes. A common theme that ties all of these together is maintaining connectivity, generally by maintaining or improving habitat and natural disturbance processes.

The action alternatives will all contribute in some way towards improved connectivity. Most of the negative cumulative impacts to connectivity stem from human population growth. Private lands, including private timber lands, are being subdivided to provide new home sites. New roads are needed to access these areas, and existing roads will likely see an increase in use. The more homes on the landscape, the less area available to lessen the restrictions on natural processes (e.g., fire). This development of private lands has been ongoing and can be expected to continue into the future.

Private lands may also have timber harvest, and depending on the design this harvest can have positive or negative impacts on connectivity. Historic timber harvest was not designed with maintaining or improving connectivity in mind.

Activities in Canada can also impact connectivity across the border with the US and the IPNF. A similar set of effects from timber harvest, private land development, motor vehicle use, and all the other factors discussed above can also occur in Canada. Additionally, there are efforts underway to manage connectivity in Canada adjacent to the IPNF. Two draft maps showing these efforts in Canada were submitted to the IPNF by the pubic during the comment period (comment letter #299 from Headwaters Montana in the project record includes these two maps). These maps were examined and it was determined that the direction in the IPNF's revised Forest Plan would be compatible with those efforts in Canada. The GA direction in the action alternatives in particular will allow wildlife to move within and through the IPNF to/from the border with Canada and the potential connectivity areas there. These efforts in Canada could maintain or improve habitat connectivity across the border with the US and the IPNF.

Effects Determination

Connectivity will be improved, maintained, or made more resilient by varying degrees under all the alternatives. This determination is based in part on:

- The desired condition (FW-DC-WL-18) is for the IPNF to work cooperatively with other agencies when there is a proposal to build or improve highways bisecting the IPNF. When crossing structures are part of those highway projects, then human activities on the IPNF will not prevent wildlife from using those crossing structures. Structures will facilitate wildlife movement across the highways and reduce the risk of vehicle caused mortality;
- The management of IPNF lands near future crossing structures will be the same for all action alternatives (FW-DC-WL-18, FW-GDL-WL-15 through 17);
- GA direction that is specifically directed at maintaining/improving connectivity includes: GA-DC-WL-CDA-03, GA-DC-WL-LK-01 and 02, GA-DC-WL-PO-01, GA-DC-WL-PR-01

and 03, and GA-DC-WL-SJ-02. Every GA will have direction related to connectivity. Combined, this direction provides connectivity within the Forest as well as connectivity to forests west, south, and east, and Canada to the north;

- Wilderness areas (MA1a-DC-WL-01, MA1b-DC-WL-01, MA1c-DC-WL-01), primitive areas (MA1e-DC-WL-01), IRAs, and other non-motorized areas (FW-STD-WL-02, MA3-DC-WL-01, and MA5-DC-WL-01) contribute to secure habitat and connectivity for some species;
- Attaining the desired conditions for vegetation will have a large impact on connectivity. As discussed above, native species will have similar amounts of connectivity habitats as found historically under natural processes if the desired conditions for vegetation are achieved. This is based on the assumption that native species evolved with the natural processes. Therefore, if habitats are restored or maintained near historical conditions and natural processes are allowed to function with less restriction, then wildlife will have the amounts and arrangement of habitats more closely approximating what they had historically; and
- Allowing fire to play a more natural role in these ecosystems through implementation of FW-DC-FIRE-03 and the MA direction would be useful for maintaining and restoring the vegetation component of connectivity that native species evolved with in these ecosystems.

Cumulative Effects Common to Most Species

This section summarizes activities and effects that are common to most species in this analysis. In the synthesizing of the wildlife specialist’s report for this FEIS repetitive information from the individual cumulative effects species’ sections were grouped together in order to make this FEIS wildlife analysis more concise. Please see the individual “Cumulative Effects” sections in each species’ section in the wildlife analysis of this FEIS for information specific to each species. Also, please see the wildlife specialist’s report where the individual species’ cumulative effects analyses have been kept separate.

In general, cumulative effects are assessed for the Forest and adjacent lands. In general, the period considered for this analysis is the anticipated life of the Plan, 10-15 years. However, some effects were evaluated over a longer timeframe if they were anticipated to last longer than the Plan (e.g., vegetation changes).

Past timber harvest, fuels reduction, and fire suppression are the most likely past activities that influenced the amount and distribution of habitat on NFS lands. Fire suppression in particular is likely to have changed stand structure and led to encroachment of conifers into natural openings and increased tree densities in formerly open canopied stands. Open roads likely impacted the distribution of snags due to firewood cutting. Road influences have decreased over time as access management has resulted in less routes open to motor vehicle use.

Fuels reduction efforts are possible on all land ownerships, in particular where they are near residences. If these are done in such a way that they restore habitat that has been degraded by fire suppression, then habitat can be improved. If not, then habitat can be lost and connectivity impacted. Continued fire suppression can further degrade habitat on all land ownerships.

Climate change will have the potential to alter the quantity, quality, and distribution of habitats across the Forest. Changes in temperature and precipitation patterns will likely influence vegetation and natural disturbance processes. Combined with past fire suppression and timber management, which has led to less resiliency, there could be an increased risk of large-scale disturbance impacting habitat. Active and passive restoration, including utilizing timber harvest and fuels reduction, that trends habitats towards historic conditions and the desired conditions for vegetation will make habitats more resilient to change. This will not only restore or maintain habitats nearer to what was present under natural disturbance processes which native wildlife evolved with, but will make them more resilient and sustainable.

All the action alternatives will contribute toward maintaining or improving habitat. Timber harvest occurring on private, state, or Canadian lands may impact the distribution, amount, and quality of habitat and may impact connectivity between NFS lands. The effects would depend on whether habitat that is outside of historic conditions is restored, habitat is maintained, and the amount of disturbance to individual animals. The desired conditions for vegetation in the revised Forest Plan will maintain or improve connectivity of habitats on the Forest.

Past mining, ski area development, utility corridor construction, and other land uses on all ownerships has decreased habitat to varying extents. Grazing has occurred and would continue to take place on lands belonging to various entities, potentially diminishing the amount of habitat or displacing individuals. Cleanup of the heavy metals contamination from mining in the Coeur d'Alene basin is ongoing and likely to continue into the future. This cleanup work would improve wildlife habitat over time, although the complete extent of improvement and how those effects overlap with effects from the revised Forest Plan is uncertain.

Ski area expansion, utility corridor construction, grazing, and mining are all possible future effects that could impact habitat or cause disturbance.

The Idaho State Wildlife Conservation Strategy would improve habitat for a variety of species, and when utilized on non-NFS ownerships should complement habitat improvement/maintenance on NFS lands. Several species analyzed in this wildlife section are specifically mentioned in the strategy.

Recreation is likely to increase on all land ownership types, if for no other reason than human population growth. This would increase human disturbance and cause the portions of NFS lands that have lower human disturbance to become more important for wildlife.

Border Patrol activities on the Forest have the potential to cause disturbance through use of roads or trails that are normally closed to motorized use. The exact extent or amount of the impact over the life of the Plan is difficult to predict because many factors could influence the amount and location of Border Patrol activity. Generally speaking, the likelihood of Border Patrol presence increases with decreasing distance from the border.

As on NFS lands, disturbance associated with human presence and most management activities will likely continue. Subdivision of private property has the potential to reduce habitat and increase disturbance, causing displacement.

Effects in wintering areas or during migration can reduce populations of certain species.

Wind turbines can cause mortality to bats and birds.

Noxious weeds can degrade habitat, including the loss of forage on important winter ranges.

Air Quality

Introduction

This report discloses the affected environment and environmental consequences to air quality that would result from implementing different programmatic level management strategies for the IPNF. More specifically, the focus of this discussion is on smoke and how the various alternatives could affect smoke production through the use of prescribed fire, the use of natural, unplanned ignitions to meet resource objectives, or emissions from wildfires. Although there are other potential sources of air pollution from management activities that occur on the IPNF (e.g., road dust, mining operations, emissions from logging equipment and recreational vehicles), smoke is the most substantial issue. Smoke can create public health issues as well as reduce the ability to view the scenery on the Forest. However, as discussed in the “Fire” and “Vegetation” sections of this final EIS, there is strong need to use fire to maintain and restore the fire-adapted ecosystems on the IPNF and as a tool to reduce hazardous fuels in the WUI.

Legal and Administrative Framework

Law and Executive Orders

- **The Federal Clean Air Act (CAA) of 1955 (as amended in 1967, 1970, 1977, and 1990):** The act is a legal mandate designed to protect public health and welfare from air pollution. Although this policy creates the foundation for air quality regulation, states and counties are often responsible for implementation of the air quality standards. The task of identifying National Ambient Air Quality Standards (NAAQS) is assigned by the Clean Air Act to the EPA. The EPA evaluates and updates these standards every 5 years. For the state of Idaho, the Idaho Department of Environmental Quality (ID DEQ) both enforces these standards and is allowed to identify stricter regulations (National Wildfire Coordination Group, 2001).

The EPA defines 6 of 33 known air pollutants as criteria pollutants for which NAAQS are set. The most common violation of a NAAQS from smoke is that of the $PM_{2.5}$ standard. Wildfires are considered a naturally occurring event from which smoke impacts may not be prevented. For natural events, state DEQ’s are required to have Natural Emergency Action Plans that identifies procedures such as notifying the public of health impacts of smoke and how to decrease and/or minimize exposure. According to the ID DEQ, this includes wanted fires (fires naturally ignited and being managed to meet resource objectives) and unwanted fires (fires naturally or man ignited that actions are taken on to fully suppress). Prescribed fires are considered anthropogenic, and therefore, subject to regulation.

Table 102 displays the NAAQS for the six criteria pollutants identified by EPA:

Table 102. National Ambient Air Quality Standards

	Primary Standards		Secondary Standards	
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour	None	
	35 ppm (40 mg/m^3)	1-hour		
Lead	0.15 µg/m^3	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m^3	Quarterly Average	Same as Primary	
Nitrogen Dioxide	53 ppb	Annual (Arithmetic Average)	Same as Primary	

	Primary Standards		Secondary Standards	
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**
	100 ppb	1-hour	None	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual (Arithmetic Average)	Same as Primary	
	35 µg/m^3	24-hour	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour	Same as Primary	
	0.08 ppm (1997 std)	8-hour	Same as Primary	
	0.12 ppm	1-hour	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Average)	0.5 ppm	3-hour
	0.14 ppm	24-hour		
	75 ppb	1-hour	None	

From http://www.epa.gov/air/criteria.html

Areas where NAAQS are frequently met, or exceeded, are considered areas of non-attainment by the EPA. To prevent NAAQS violations, Idaho has designated these areas and other areas of concern as Impact Zones. In accordance with the Interim Policy, Idaho also has a smoke management plan which provides some flexibility should a NAAQS violations occur due to smoke. The combination of actions a state takes to regulate smoke, track and monitor pollutants, and enforce violations are known as a state implementation plan.

The Clean Air Act Amendment of 1977 designates mandatory visibility protection of Class I Airsheds which include wilderness areas established before 1977 that are greater than 5,000 acres. The Wilderness Act of 1964 mandates that the Forest Service preserves and protects the natural condition of designated wilderness areas (regardless of Class I designation), including the intrinsic wilderness value of air quality.

Currently the Forest Service participates in an organization known as the Montana-Idaho Airshed Group (2010) for prescribed burns within the state of Idaho. Group members submit prescribed burns to the smoke management unit for daily, site-specific approval. The smoke management unit is responsible for making sound and timely decisions to maximize the amount of smoke being put in the air (acres burned) and minimizes adverse air quality impacts based on individual airsheds throughout Idaho and Montana. Adherence to the Montana/Idaho Airshed Group Operating Guide (2010) is the current accepted smoke management plan for the state of Idaho.

The portion of the IPNF within the state of Washington requires that prescribed burns be approved through the Washington Department of Natural Resources. They are responsible for coordinating with the Washington Department of Ecology to carry out the state implementation plan for Washington State.

In addition, air quality is addressed for every prescribed burn in the individual prescribed fire plan. The Forest Service Handbook requires a documented burn plan that contains all of the elements outlined in the 2008 Interagency Prescribed Fire Planning and Implementation Procedures Guide. This guide prompts the burn plan author to address all laws and regulations concerning smoke management as well as the potential for localized nuisance smoke impacts.

In 1998 the EPA released the *Interim Air Quality Policy on Wildland and Prescribed Fires* (Interim Policy). The document was published with the intent of integrating two public policy goals, "(1) to allow fire to function, as nearly as possible, in its natural role in maintaining healthy wildland ecosystems, and (2) to protect public health and welfare by mitigating the impacts of air pollutant emissions on air quality and visibility." This document recognizes the goal of the National Fire Plan (1995, revised in 2001) to implement fuel reduction projects in the WUI and return fire to landscapes, and the impacts this will have on air quality.

Wildfire smoke can produce three of six criteria pollutants the EPA has set maximum standards for to protect human and environmental health. These include carbon monoxide, particulate matter, and volatile organic compounds that can produce ground-level ozone (http://www.epa.gov/air/ozonepollution/). Seventy percent of smoke emissions are made up of small particulate matter ($PM_{2.5}$ or particulate matter smaller than 2.5 micrometers) which has been proven to cause adverse health effects in humans (http://www.epa.gov/pm/health.html). Because of this, wildfire smoke from natural, unplanned ignitions and prescribed fire poses a potential health threat to the public. Another smoke emission that poses health risks to humans is carbon monoxide, which can cause short-term health related problems for firefighters. Carbon monoxide rapidly mixes with surrounding air at short distances from a burn area, therefore, poses little to no risk to the general public (Sandberg and Dost 1990). Ground-level ozone, although not a direct product of smoke emissions is a concern due to its effect on lung function and plant growth.

The small size of $PM_{2.5}$ makes these particles highly efficient at scattering light, causing visibility issues, and contributing to what the EPA has called "Regional Haze." The Regional Haze Rule, promulgated by the EPA in 1999, addresses improving visibility in Class I airsheds such as wilderness areas and National Parks. Regardless of whether smoke violates air quality standards, localized impacts of burning can cause visibility issues on public roadways. Nuisance smoke is defined by the EPA (US EPA 1990) as the amount of smoke in the ambient air that interferes with a right or privilege common to members of the public, including the use or enjoyment of public or private resources.

Key Indicator

- Ambient air quality and visibility.

Methodology and Analysis Process

A qualitative assessment of smoke emissions and consequences to ambient air quality and visibility was used as the indicator for effects to air quality. The actual quantitative smoke that would be produced by each alternative and the impacts on air quality are too variable to accurately predict. Potential emissions from wildfires are difficult to predict as they would vary depending upon site-specific vegetation and fuels conditions, ignitions, weather, and available suppression resources. Emissions from the use of prescribe fire and the use of natural, unplanned ignitions to meet resource objectives is also difficult to predict quantitatively. Therefore, the comparison of alternatives is based on a qualitative assessment of the relative amounts and timing of smoke that may be emitted by the alternatives.

Affected Environment (Existing Condition)

Because the area contained within the IPNF boundary is relatively rural, non-forest pollution sources such as industry and heavy automobile traffic have not greatly impacted air quality. Industrial sources of pollution within the Forest may include timber and mining operations. Dust from forest roads may also contribute to fine particulates in the air. Contributions from forest operations are generally minimal and have not been shown to contribute to NAAQS violations. Voluntary smoke management from forest industry, state and federal partners has helped prevent NAAQS violations and reduced nuisance smoke.

Areas of concern within the Forest include the impact zones of Sandpoint, Coeur d'Alene (labeled Fernan) and Pinehurst (see figure 32). Impact zones are created for populated areas where air quality concerns to public health arise as NAAQS are sometimes exceeded or close to exceeding. Sandpoint and Pinehurst are both areas of non-attainment for the criteria pollutant PM_{10}. Areas of population generally exist in valley bottoms where mixing and dispersion of air is reduced. Sources of pollution within these impact zones, including wildfire smoke, are closely monitored and regulated.

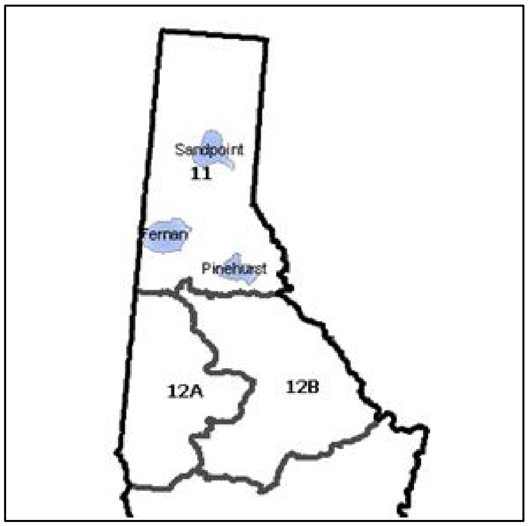


Figure 32. Idaho Airsheds and Impact Zones taken from the MT/ID Airshed Group 2010 Operations Guide

The ID DEQ has a network of air quality monitors throughout the state. Real-time data is tracked to identify times of poor air quality and notify the public of potential concerns. The MT/ID Airshed Group accesses this information in making burn approval decisions.

Because of the health impacts caused by wildfire smoke, the Northern Rockies Coordinating Group created the *Montana-Idaho Interagency Smoke Management Strategy for the Mitigation of Public Health and Welfare Impacts Caused by Smoke from Unplanned Ignitions* (2010). Although this document is not intended to be legally enforceable, the Integration Strategy is meant to communicate roles and responsibilities (for land managers as well as others), inform the public, identify coordination activities, provide lessons learned and examples of good smoke management, and provide for future revision.

Visibility monitoring is done through the Interagency Monitoring of Protected Visual Environments Network, which exists through cooperation efforts from the EPA, state regulatory agencies, and federal land managers. This monitoring network establishes current air quality conditions for Class I areas and tracks progress towards the national visibility goal outlined in the Clean Air Act. The interagency monitoring of protected visual environments provides a standardized system to identify long-term trend and determine the types of pollutants and sources responsible for visibility impairments (http://vista.cira.colostate.edu/improve/Overview/Overview.htm).

Region 1 of the Forest Service currently has what is called the "USFS R1 Air Quality Monitoring Plan" (USDA Forest Service 1997 April). Monitoring protocols for air quality related values for Class I areas and wilderness air quality values are defined and documented. Part of the monitoring plan includes participation in the Interagency Monitoring of Protected Visual Environments Network.

Environmental Consequences

Management Direction

All of the alternatives contain essentially the same Forest Plan direction regarding the desire and need to meet federal, state and local air quality standards and direction. The 1987 Forest Plan contains forestwide objectives (objective item O, pg. II-9) and standards (Air Quality standards 1-4, pg. II-34) and the action alternatives contain forestwide desired conditions (FW-DC-AQ-01) and guidelines (FW-GDL-AQ-01) that are similar in nature. Therefore, the direction that is specific to air quality in the various alternatives would have similar consequences. That is, the direction is designed to meet applicable laws and regulations.

The management direction that could have consequences to smoke production includes direction that would affect how much prescribed fire would occur, how much natural, unplanned ignition is managed to meet resource objectives, and how much wildfire may occur. The alternatives do contain plan components related to fire that could influence these elements and they are summarized below.

General Effects

Because prescribed fire smoke is closely regulated by the smoke management unit, any additional prescribed fire acres would have to be accomplished on burn days where smoke dispersion is good and the Impact Zones are not affected.

The Cabinet Mountain Wilderness on the KNF is a Class I Airshed based on the 1977 Amendment of the Clean Air Act. Due to its location, this wilderness has the potential to be impacted from smoke produced on the IPNF. Although the Salmo-Priest Wilderness does not meet the regulation of a Class I Airshed, wilderness air quality values should be considered.

Smoke from wildfires is predicted to remain the same across all the alternatives, including the no-action alternative. The difference in smoke inputs during wildfire season would be due to the contribution of the smoke from natural, unplanned ignitions managed to meet resource objectives. Because a natural, unplanned ignition that is being managed to meet resource objectives is still considered a natural event, smoke from these events currently does not require approval from the MT/ID Airshed Group or ID DEQ. The effects of the added smoke input to the airshed during the summer may or may not be adverse. Because managing natural, unplanned ignitions to meet resource objectives is most suitable for backcountry areas away from human populations, air quality effects should be minimal to public health.

The different alternatives have varying levels of emphasis on managing natural, unplanned ignitions to meet resource objectives. Because of this, the effect on air quality may differ between the alternatives. Alternative C places the greatest influence on natural disturbance processes, including wildfire. Based on this goal, this alternative could potentially create the greatest amount of smoke. Alternative D places management emphasis on active management, including timber harvest. Although backcountry areas would still encourage managing natural, unplanned ignitions to meet resource objectives, the acreage of the backcountry MA is slightly reduced which could reduce the amount of acres burned. In terms of air quality affects, Alternative B Modified lies somewhere between C and D. Not as much emphasis is placed on natural disturbances as Alternative C; however, the opportunity for managing natural, unplanned ignitions to meet resource objectives under this alternative in terms of backcountry acres is greater than Alternative D.

Smoke produced from managing natural, unplanned ignitions to meet resource objectives will vary spatially and temporally. The decision to manage a natural, unplanned ignition to meet resource objectives affects many resources, including air quality. Despite the lack of specific air-quality regulations on natural, unplanned ignitions that are being managed to meet resource objectives, consideration is given to the effect the fire will have on air quality during the decision process. Working with the ID DEQ and avoiding decisions that will cause health and welfare concerns to the public will minimize the effects of managing natural, unplanned ignitions to meet resource objectives on air quality.

Cumulative Effects

Air quality is a complex issue. Inputs of pollutants into an airshed can be from automobile exhaust, industry, dust from driving on dry roads or wind events, wood stoves, agricultural burning, and wildland fires. The range of sources of these pollutants, climatology, and topography all influence air quality conditions at any given location. The air quality on the IPNF is affected by actions occurring hundreds of miles away, such as agricultural burning and/or tilling (Hammer 2003). If a neighboring national forest chooses to manage a natural, unplanned ignition to meet resource objectives, this decision may have air quality impacts on the IPNF and vice versa.

In the case of managing a natural, unplanned ignition to meet resource objectives, the Forest Service may choose to allow the fire to burn and perform a natural role, regardless of whether initial attack fire resources have the ability to suppress the ignition. Certain circumstances will limit the IPNF from managing natural, unplanned ignition to meet resource objectives, including air quality. While there is not specific regulation addressing wildfires, the ID DEQ still maintains the authority to enforce NAAQS, including stopping land managers from allowing a fire to burn during times of poor air quality.

The city of Coeur d’Alene currently receives special attention during the summer months due to increased ground-level ozone. High levels of ozone causes reduced lung function and can be particularly troublesome for individuals with respiratory illness. Repeated or prolonged exposure may cause permanent damage to human lungs as well as harm agricultural crops and forests by interfering with plants’ photosynthesis process. Ozone is not directly produced from cars, industrial pollution, or wildfire smoke; however, all emit photochemical pollutants which are ozone precursors. These photochemical pollutants react to heat from sunlight and produce ozone. Ground-level ozone is a concern and is closely monitored in the city of Coeur d’Alene. Consideration should be given when smoke, even from far-away sources, is input into the Coeur d’Alene Impact Zone (Idaho DEQ 2010).

Human Uses and Designations of the Forest

This section includes the following resources:

- Access and Recreation
- Lands/Special Uses
- Inventoried Roadless Areas
- Designated Wilderness, Wilderness Study Area, Recommended Wilderness
- Wild and Scenic Rivers
- Research Natural Areas
- Special Areas
- Experimental Forests
- Cultural Resources
- American Indian Rights and Interests

Access and Recreation

Introduction

The focus of outdoor recreation management is to provide a wide range of environmentally sustainable opportunities in natural settings in order to meet the needs and desires of visitors. People have always enjoyed relatively free access to recreation opportunities on federal public lands, although recreation was not a high priority when national forests were first created. Recreation use was present at that time, but it was an unstated secondary benefit, enjoyed by a relative few. However, since the end of World War II, demand for outdoor recreation on public land has grown. This section covers Transportation Systems, including Road Trail Management Objectives, Travel Management, and Road and Trail Maintenance; and Recreation, including Recreation Settings, Developed Recreation, Dispersed Recreation, Recreation Special Use Authorizations, and, Scenery/Landscape Management.

Access, using roads and trails, is associated with virtually every activity that takes place on the IPNF. Roads and trails accommodate many purposes such as; outdoor recreation, fire suppression, wildlife management, transport of natural resources such as logs and minerals, firewood gathering, private in-holding access, electronic site and utility corridor maintenance, and managing and monitoring forest resources.

Modes of vehicle travel on the Forest include: large commercial trucks, cars, pickups, four-wheel drive vehicles, over-snow vehicles, off-road vehicles (e.g., motorcycles, ATVs), mountain bikes, and wheelchairs. Other non-vehicular travel modes include cross-country/back-country skiing, snowshoeing, dog sledding, horseback riding, and hiking.

These various forms of travel may occur on designated paved, aggregate, or native surface roads, and trails managed for motorized and/or non-motorized use.

Legal and Administrative Framework

Law and Executive Orders

- **Organic Administration Act of June 4, 1897 (30 Stat. 11, as amended):** This act authorizes the establishment of national forests.
- **Multiple-Use Sustained-Yield Act of June 12, 1960 (P.L.86-517, 74 Stat.215):** This act provides direction to the NFS lands to provide access and recreation opportunities. The act states, “The policy of Congress is that national forests are established and administered for outdoor recreation…”
- **Term Permit Act of March 4, 1915 (P.L. 63-293, Ch. 144, 38 Stat. 1101, as amended; 16 U.S.C. 497):** This act provides direction to the NFS lands to authorize occupancy for a wide variety of uses through permits not exceeding 30 years.
- **National Forest Roads and Trails Act of October 13, 1964 (P.L. 88-657, 78 Stat. 1089, as amended):** This act declared that an adequate system of roads and trails be constructed and maintained to meet the increasing demand for recreation and other uses. This act authorizes road and trail systems for the national forests. It authorizes granting of easements across NFS lands, construction and financing of maximum economy roads (FSM 7705), and imposition of requirements on road users for maintaining and reconstructing roads, including cooperative deposits for that work.

- **The Wilderness Act of September 9, 1964 (16 U.S.C. 1131(note), 1131-1136):** This act establishes the National Wilderness Preservation System to be administered for the "…use and enjoyment of the American people…"
- **Land and Water Conservation Fund Act of 1965 (P.L. 88-578, 78 Stat. 897 as amended; 16 U.S.C. 460l-4(note); 460l-4 thru 6a, 460l-7 thru 460l-10, 460l-10a-d, 460l-11):** "The purposes of this act are to assist in preserving, developing, and assuring accessibility to all citizens of the United States of America…such quality and quantity of outdoor recreation resources…providing funds for:" 1. States for acquisition, planning, and development of recreation facilities and; 2. Federal acquisition and development of certain lands and other areas.
- **Highway Safety Act of September 9, 1966 (P.L. 89-564, 80 Stat. 731, as amended):** This act authorizes state and local governments and participating federal agencies to identify and survey accident locations; to design, construct, and maintain roads in accordance with safety standards; to apply sound traffic control principles and standards; and to promote pedestrian safety.
- **Architectural Barriers Act of August 12, 1968 (P.L. 90-480, 82 Stat. 718 51 U.S.C. 4151-4154, 4154a, 4155-4157):** This act establishes additional requirements to ensure that buildings, facilities, rail passenger cars, and vehicles are accessible to individuals with disabilities. It covers architecture and design, transportation, and communication elements of recreational site planning and development.
- **Wild and Scenic Rivers Act of October 2, 1968 (P.L. 90-542, 82 Stat. 906, as amended):** This act establishes a National Wild and Scenic Rivers System with three classes of river systems: wild, scenic, and recreation. The purpose of the act was to protect the river "…for the benefit and enjoyment of present and future generations."
- **National Trails System Act of October 2, 1968 (P.L. 90-543, 82 Stat.919, as amended):** This act establishes the National Trails System and authorizes planning, right-of-way acquisition, and construction of trails established by Congress or the Secretary of Agriculture.
- **Federal Aid Highway Act of 1968, as amended (23 U.S.C. 109(a) and (h), 144, 151, 319, and 351):** Establishes the National Bridge Inspection Standards (23 CFR Part 650, Subpart C) and the requirement that each state have a current inventory of bridges on all public roads, including NFS roads open to public travel (FSM 1535.11).
- **Rehabilitation Act of September 26, 1973 (P.L. 93-112, Title V, 87 Stat. 390, as amended; 29 U.S.C. 791, 793-794, 794a, 794b):** This act requires that programs and activities conducted by federal agencies and by entities that receive funding from, or operate under a permit from, federal agencies provide an equal opportunity for individuals with disabilities to participate in an integrated setting, as independently as possible. The only exception to the requirement is when the program would be fundamentally altered if changes were made solely for the purpose of accessibility.
- **Forest and Rangeland Renewable Resources Planning Act of August 17, 1974 (P.L. 93-378, 88 Stat. 476, as amended):** This act declares (per Sec. 10) that "…the installation of a proper system of transportation to service the NFS ….shall be carried forward in time to meet anticipated needs on an economical and environmentally sound basis…"
- **Federal Land Policy and Management Act of October 21, 1976 (P.L. 94-579, 90 Stat. 2742, as amended):** This act declares (per Sec. 102) that "…the public lands be managed in a manner that…will provide for outdoor recreation and human occupancy and use."

- **Surface Transportation Assistance Act of 1978 (P.L. 95-599, as amended). Supersedes the Forest Highway Act of 1958:** Authorizes appropriations for forest highways and public lands highways. Establishes criteria for forest highways; defines forest roads, forest development roads, and forest development trails (referred to as "NFS roads" and "NFS trails" in Forest Service regulations and directives); and limits the size of projects performed by Forest Service employees on forest roads. Establishes the Federal Lands Highway Program.
- **American Indian Religious Freedom Act of August 11, 1978 (42 U.S.C. 1996):** This act states the policy of the United States to preserve and protect the rights of Native Americans to reasonable access and use NFS lands for exercising their traditional cultural religious beliefs and practices. This act does not grant authority to issue authorizations.
- **Rails to Trails (National Trails System Improvements Act of October 4, 1988 (P.L. 100-470, 102 Stat. 2281; 16 U.S.C. 1241(note); 12 U.S.C. 1248(note))):** This act was enacted to facilitate the development of trail systems by federal, state, or local governments on railroad rights-of-way that may be suitable for trail use when such rights-of-way are abandoned.
- **Federal Cave Resources Protection Act of November 18, 1988 (P.L. 100-691, 102 Stat. 4546; 16 U.S.C. 4301 note, 4301 to 4309):** This act was enacted to secure, protect, and preserve significant caves on federal lands for the perpetual use, enjoyment, and benefit of all people.
- **Ski Fees, Omnibus Parks and Public Lands Management Act of November 12, 1996 (Pub. L. 104-333, div. I, Title VII, Sec. 701, 110 Stat. 4182; 16 U.S.C. 497c):** Section 701 of this act:
    - Establishes a system to calculate fees for ski area permits issued under the National Forest Ski Area Permit Act of 1986 (16 U.S.C. 497b);
    - Provides for holders of ski area permits issued under other authorities to elect this permit fee system (FSH 2709.11, sec. 38.03a);
    - Includes provisions concerning compliance with NEPA when issuing permits for existing ski areas (FSM 2721.61f and FSH 2709.11, sec. 41.61b); and
    - Withdraws leasable and locatable minerals, subject to valid existing rights (FSH 2709.11, sec. 41.61c).
- **Secure Rural Schools and Community Self-Determination Act of October 30, 2000 (P. L. 106-393, 114 Stat. 1607; 16 U.S.C.500 note):** This act provides provisions to make additional investments in, and create additional employment opportunities through, projects that improve the maintenance of existing infrastructure, implement stewardship objectives that enhance forest ecosystems, and restore and improve land health and water quality.
- **Federal Lands Recreation Enhancement Act of December 8, 2004 (P.L. 108-447, as amended)**: This act gives the Secretaries of Agriculture and Interior the authority to establish, modify, charge, and collect recreation fees at federal recreational lands where a certain level of amenities have been developed.
- **Omnibus Public Land Management Act of March 30, 2009 (P.L. 111-11, Title V, Section 5205):** This act designated the Pacific Northwest National Scenic Trail including the section that crosses the IPNF.
- **Moving Ahead for Progress in the 21st-Century Act of July 6, 2012 (P.L. 112-141):** Replaces the Federal Lands Highway Program with the Federal Lands Transportation Program and Federal Lands Access Program. This act authorizes funding for federal lands transportation facilities and federal lands access transportation facilities under a unified program with policy similar to federal-aid highways and other public transportation

facilities. It requires Federal Land Management Agencies to identify a comprehensive inventory of public federal lands transportation facilities that, at a minimum, includes the transportation facilities that provide access to high-use federal recreation sites or federal economic generators.

- **Executive Order 11644 (as amended):** Establishes policy and procedure "…that will ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands."
- **Executive Order 12862:** Setting Customer Service Standards requires information about quantity and quality of recreation visits for national forest plans.

Code of Federal Regulations (CFR)

- **36 CFR 212 –** Travel Management
- **36 CFR 219 –** Planning
- **36 CFR 251 –** Land Uses
- **36 CFR 261 –** Prohibitions
- **36 CFR 290 –** Cave Resources Management
- **36 CFR 291 –** Occupancy and Use of Developed Sites and Areas of Concentrated Public Use
- **36 CFR 293 –** Wilderness-Primitive Areas
- **36 CFR 294 –** Special Areas
- **36 CFR 297 –** Wild and Scenic Rivers

Other Policy and Guidance

- **National Best Management Practices for Water Quality Management on National Forest System Lands Volume 1: National Core BMP Technical Guide, April 2012:** The first volume of guidance for the USDA Forest Service National Best Management Practices (BMP) Program. The National BMP Program was developed to improve agency performance and accountability in managing water quality consistent with the Federal Clean Water Act (CWA) and State water quality programs. Current Forest Service policy directs compliance with required CWA permits and State regulations and requires the use of BMPs to control nonpoint source pollution to meet applicable water quality standards and other CWA requirements. It includes road management activity BMPs for construction, operation, and maintenance for roads and motorized trails.

Key Indicators

- Percent of the Forest and location of areas where roads and trails may be designated for motor vehicle use;
- Percent of the Forest and location of areas where over-snow vehicle use is allowed;
- Percent of the Forest and location of areas where mechanized use is allowed;
- Percent of the Forest and location managed in the various recreation opportunity spectrum (ROS) classes; and
- Percent of the Forest managed in the various scenery management systems and scenic integrity objective categories.

Methodology and Analysis Process

For comparative purposes, each alternative was analyzed for the total number of acres by MA allocation, where motor vehicle use may be designated, over-snow vehicle use would be allowed, or mechanized use would be allowed.

Each MA identifies whether motor vehicle use, over-snow vehicle use, or mechanized use is allowed. GIS is used to calculate the number of acres for each MA across the Forest. Acres currently closed to over-snow vehicle use are also included. The summary acres where motor vehicle use, over-snow vehicle use, and mechanized use is allowed for each alternative were calculated.

Note: Where **motor-vehicle use** is discussed relative to road, trail, and area designation or cross-country prohibitions, it includes all types of motor vehicles which are self-propelled and capable of or designed for, travel on or immediately over land or other natural terrain **excluding** over-snow vehicle use, vehicles operated on rails, and wheelchair or mobility devices as defined at 36 CFR 212.1. This generally indicates wheeled motor vehicles but includes those vehicles that have the driving wheels moving inside endless tracks (or are capable of such conversion) when operating outside snow-covered ground conditions.

Over-snow vehicles are defined as motor vehicles designed for use over-snow that run on a track or tracks and/or a ski or skis, **while in use over-snow** (36 CFR 212.1). These two recreation opportunities are considered as separate activities in this analysis and are referred to as either “motor vehicle use” or “over-snow vehicle use.”

Each alternative was analyzed for the total number of acres and percentage of the Forest managed in various ROS classes and categories of scenic integrity objectives. Each MA includes direction for the ROS class and scenic integrity objectives that is most appropriate for management of that area of the Forest.

Changes between Draft and Final

Change in Terminology

The DEIS and draft Forest Plan used the term “wheeled motor vehicle use” when referring to designated road, trail, and area motorized recreation opportunities in the absence of snow-covered ground conditions. The term “over-snow vehicle” is used when referring to winter (snow-covered ground conditions) motorized recreation opportunities. (See the glossary for the full definitions per 36 CFR 212.) The descriptive “wheeled” was included to contrast with over-snow vehicle use as the two recreation opportunities are considered and analyzed separately as distinct activities in the environmental analysis.

However, “wheeled motor vehicle use” is not consistent with the language at 36 CFR 212 or current IPNF motor vehicle use maps (MVUMs) and the associated legal order. The regulations at 36 CFR 212.50 state that “after these roads, trails, and areas are designated, motor vehicle use, including the class of vehicle and time of year, not in accordance with these designations is prohibited by 36 CFR 261.13” and is followed with an exemption for over-snow vehicles at 36 CFR 212.5. The legal order on the IPNF MVUMs state: “It is prohibited to possess or operate a motor vehicle on NFS lands on the IPNF other than in accordance with these designations (36 CFR 261.13)…” This map does not display nonmotorized uses, over-snow uses, or other facilities and attractions on the IPNF...”

Existing legal orders under 36 CFR 261.50 and 36 CFR 261.54 establish where over-snow vehicle use is legally allowed or prohibited until the IPNF undertakes over-snow vehicle travel management planning per 36 CFR 212 Subpart C.

Therefore, for clarification and consistency with existing regulation and law, the FEIS and revised Forest Plan drop the “wheeled” descriptive and simply use the term “motor vehicle use” (excluding over-snow vehicle use) when referring to road, trail, and area designations. This does not change any existing or analyzed recreation opportunity and only clarifies terminology.

Update to Recreation Opportunity Spectrum (ROS) Analysis

The DEIS and draft Forest Plan displayed acres of ROS two different ways: ROS as inventoried and ROS desired condition by MA. The draft Forest Plan desired condition for MA6 ROS was Roaded Natural. In the revised Forest Plan, the desired condition for MA6 has been updated to a range from Semi-Primitive Non-motorized to Roaded Natural.

A combination of the Inventoried ROS and the MA ROS was used for analyzing acres by ROS for each alternative in the FEIS. The revised Forest Plan indicates the ROS or range of ROS for each MA. Where a range of ROS is given for a MA, the acres of inventoried ROS were used to determine acres by ROS.

Update to Acres of Closure Areas

The acres restricted to over-snow vehicle use by Administrative zone were updated to reflect the most recent information on closure areas.

Update to Acres Allowing Road Construction

These acres were corrected in the FEIS to reflect MA direction.

Affected Environment (Existing Condition)

Transportation System

Across the IPNF there are approximately 8,684 miles of roads and 2,694 miles of trails under Forest Service jurisdiction. Additional miles of roads and trails cross the Forest, but are managed and administered by other jurisdictions such as the BLM, state, county, or private.

National Forest System roads and trails are an infrastructure capital investment that support forest management activities and recreation access and are considered physical assets. Since the end of WWII, an extensive system of roads has been constructed that has continual management and maintenance needs. Early trails served as routes for migration, foraging, hunting, trapping, and early forest management. Many of those original trails provide recreation access today. The direction for effective and efficient management of NFS roads is founded in laws, regulations, and agency directives.

One part of the direction requires management objectives be established for NFS routes. These management objectives take into consideration: MA direction; needs for coordination of uses; access management; and route design, operation, and maintenance criteria.

Road Management Objectives

In order to develop road management objectives, a variety of descriptive conditions are used. The more prominent ones are:

- **Functional Class –** The way a road services land and resource management needs, and the character of service it provides.
    - **Arterial –** A road that provides service to large land areas and usually connects with other arterial roads or public highways.
    - **Collector –** A road that serves smaller areas than an arterial road and usually connects arterial roads to local roads or terminal facilities.
    - **Local –** A road that connects a terminal facility with collector roads, arterial roads, or public highways and usually serves a single purpose involving intermittent use.

This branching system of arterial, collector, and local roads is the network that provides access to NFS lands. Most arterial and collector roads are surfaced, generally with aggregate, although some have a paved surface. Most local roads are native surfaced. Table 103 displays the miles by functional class.

Table 103. Summary of IPNF Roads by Functional Class

Functional Class	Miles
Arterial	467
Collector	2,277
Local	5,883
Not Assigned	57
Total	**8,684**

Source: Infra - Travel Routes 2/2013

- **Traffic Service Level –** The significant traffic characteristics and operating conditions for a road.
    - **Level A –** Free flowing, mixed traffic; stable, smooth surface. Provides safe service to all traffic.
    - **Level B –** Congested during heavy traffic, slower speeds and periodic dust; accommodates any legal size load or vehicle.
    - **Level C –** Interrupted traffic flow, limited passing facilities, may not accommodate some vehicles. Low design speeds. Unstable surface under certain traffic or weather.
    - **Level D –** Traffic flow is slow and may be blocked by management activities. Two-way traffic is difficult; backing may be required. Rough and irregular surface. Travel with low clearance vehicles is difficult. Single purpose facility.

Table 104 displays the miles by traffic service level.

Table 104. Summary of IPNF Roads by Traffic Service Level

Traffic Service Level	Miles
Level A	182
Level B	242
Level C	1,826
Level D	6,297
Not Assigned	137
Total	**8,684**

Source: Infra - Travel Routes 2/2013

- **Operational Maintenance Level –** The maintenance level currently assigned to the road considering today's needs, road condition, budget constraints, and environmental concerns. In other words, it defines the level to which the road is currently being maintained.
  - **Level 5 –** Assigned to roads that provide a high degree of user comfort and convenience.
  - **Level 4 –** Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds.
  - **Level 3 –** Assigned to roads open for and maintained for travel by a prudent driver in a standard passenger car.
  - **Level 2 –** Assigned to roads open for use by high clearance vehicles.
  - **Level 1 –** Assigned to roads that have been placed in storage (greater than 1 year) between intermittent uses. Basic custodial maintenance is performed. Road is closed to vehicular traffic.

Table 105 displays the miles of roads by operational maintenance level. Figure 33 displays the operational maintenance level by district.

Table 105. Summary of IPNF Roads by Operational Maintenance Level

Operational Maintenance Level	Miles
Level 5	78
Level 4	221
Level 3	1,776
Level 2	2,909
Level 1	3,666
Not Assigned	34
Total	**8,684**

Source: Infra - Travel Routes 2/2013

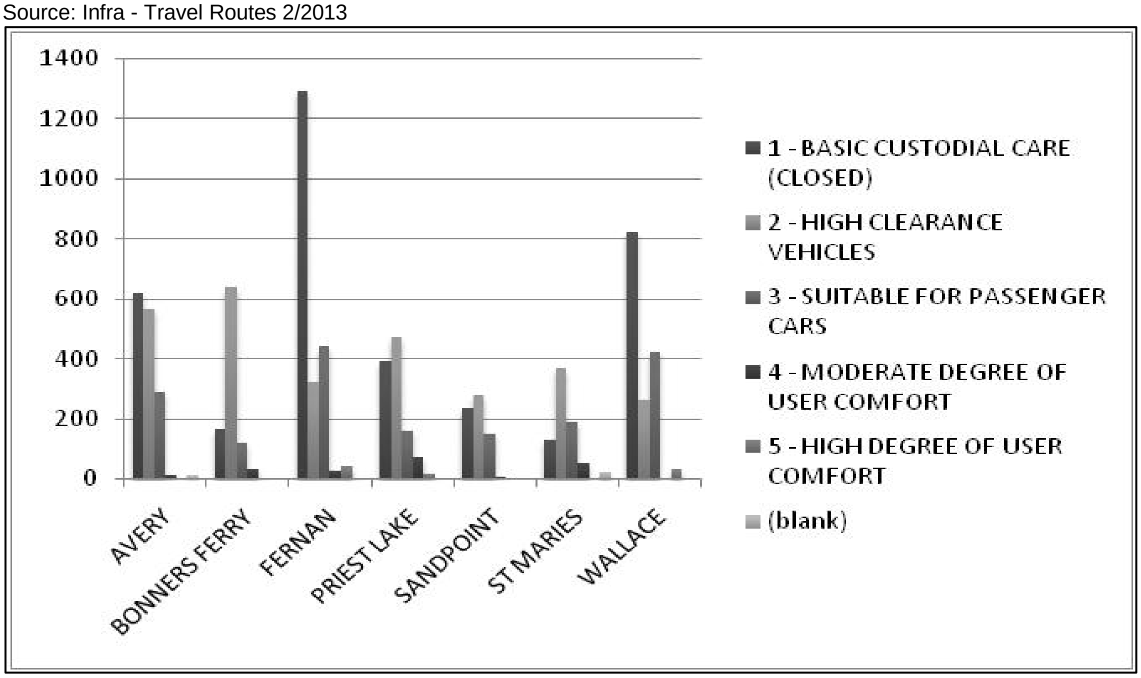


Figure 33. Operational Maintenance Level by District

As a result of financial limitations and requirements to meet other resource objectives, the trend has been to progress toward fewer miles of NFS roads on the IPNF. Over the last 20 years, the IPNF has decommissioned approximately 1,550 miles of road.

The IPNF has also been treating roads and putting them into what is termed "intermittent stored service." These roads have been identified as needed (generally within the next 10 to 20 years) as part of the minimum road system and are treated to reduce the risk of undesirable resource impacts in the absence of routine maintenance while in stored (closed) status. Currently, the IPNF has about 3,666 miles of NFS roads in an intermittent stored service status.

Site-specific, project-level travel analyses conducted across the IPNF are used to prioritize maintenance needs and identify opportunities for decommissioning roads or treating roads for intermittent stored service as the IPNF works to identify the minimum number of routes needed for an efficient transportation system as directed in 36 CFR 212 subpart A.

Trail Management Objectives

Trail management objectives (TMOs) are the documentation of the intended purpose and management of an NFS trail based on management direction, including the access objectives. Two concepts defined in the Federal Trail Data Standards developed by FS, NPS, BLM and FWS include:

Trail Class: The prescribed scale of development for a trail, representing its intended design and management standards:

- **Trail Class 1 –** Minimally Developed
- **Trail Class 2 –** Moderately Developed
- **Trail Class 3 –** Developed
- **Trail Class 4 –** Highly Developed
- **Trail Class 5 –** Fully Developed

Managed Use: Managed uses are the modes of travel that are actively managed and appropriate on a trail, based on its design and management.

Managed use indicates the intent to accommodate a specific use. Accommodating the managed use frequently results in user-specific trail maintenance and/or signing needs and costs. There can be more than one managed use per trail or trail segment and the managed use is usually a subset of the allowed uses on the trail (which may include motor vehicle use designations in some locations).

Table 106 displays the miles of trails on the IPNF managed for various uses.

Table 106. Miles of Trails Managed Use on the IPNF*

Managed Use	Miles
Hiker/Pedestrian	1,482
Pack and Saddle	1,151
Bicycle	64
ATV	804
Motorcycle	730

Managed Use	Miles
Cross-Country Ski	52
Snowshoe	9
Snowmobile	1,415

* Total miles of managed use will not sum equal to miles of existing trail as there may be overlapping managed uses per trail or trail segment
Source: Infra Travel Routes 2/2013 (Miles have been rounded)

Travel Management

Travel management is one of the most controversial issues currently facing federal land managers. The Forest Service approaches access and travel management with the recognition that it affects every program we have and every person we serve. The overarching aim is to seek a balance of access opportunities on NFS lands while considering physical conditions, resource needs, user conflicts, and user safety.

Travel Management History

Early efforts to manage motorized travel on the IPNF began with specially-designated areas. For example, in 1969 the Mallard-Larkins area in the St. Joe NF was classified as a “Pioneer Area” under the Secretary of Agriculture’s U-3 Regulation, which stipulated no roads or motorized transportation. Other special areas having motorized travel restrictions prior to comprehensive forest travel planning included the Upper Priest Lake Scenic Area; two botanical areas: Settlers Grove of Ancient Cedars and the Hobo Creek Cedar Grove; and four research natural areas: Teepee Creek, Canyon Creek, Montford Creek, and Upper Fishhook Creek. These restrictions were implemented in order to maintain the special characteristics and high aesthetic values of the areas. Officials also added restrictions over time, typically to eliminate incompatible recreation uses.

The IPNF first initiated comprehensive forest-level travel planning as a result of Executive Order (EO) 11644 signed in 1972 (and amended by EO 11989 in 1977), which established a federal off-road vehicle (ORV) policy to “… ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resource of those lands, to promote the safety of all users of those lands and to minimize conflicts among the various users of those lands.”

In response to this EO, the IPNF published its first Travel Plan in September 1976 after completing an environmental assessment. The 1976 Travel Plan required ongoing motor vehicle use monitoring, and as a result, was updated periodically. In 1978, 1979, and 1980, the IPNF published supplements to the original environmental assessment that provided for minor additional closures, revised some dates, and added protection to snowmobile trails and game. The process included public involvement, and the Forest received comments from individuals and special-interest groups both supporting and opposing restrictions on motorized travel during this time.

In 1981, the IPNF published a new Travel Plan, again to resolve user conflicts and protect natural resources. Based on the former plan, the 1981 Plan included additional restrictions to improve trout spawning habitat, elk security, and grizzly bear protection, and to reduce horse/vehicle and other conflicts.

In 1987 when the IPNF published its Forest Plan, Forest Service road management policy provided “that all roads on national forest lands shall remain open for public use unless there are sound reasons in the interest of the public and/or resource protection for their closure." The policy allowed for closure of forest roads for the following reasons: 1) protection of road surface and/or soil and water resources, 2) protection of fish and wildlife species and/or habitat, 3) provision for a full range of recreational experiences, and 4) protection of private and/or government equipment, products and facilities. The policy also allowed for closures during periods of extreme fire danger, and for public safety.

With respect to recreation travel, the 1987 Forest Plan emphasized increasing opportunities for outdoor recreation. Specific objectives included increasing the number of developed recreation facilities, emphasizing dispersed recreation opportunities, and increasing and improving the recreation trail system, consistent with management area objectives. The plan allowed for motorized use in proposed wilderness areas, with the exception of the Mallard-Larkins, St. Joe Wild River, and Upper Priest River areas.

Travel maps for the ranger districts and/or the individual forests that comprise the IPNF were published from 1979 through 2007. The maps were updated as needed, but not necessarily on a yearly basis. The maps displayed route and area restrictions by season and mode of travel. In addition, recreation sites, routes, and areas that were open year-round to all types of uses were displayed.

In 2005, the Forest Service published the final rule for, Travel Management-Designated Routes and Areas for Motor Vehicle Use, in order to clarify policy related to motor vehicle use, including the use of off-road vehicles. Contrary to past policy that allowed motor vehicle use except where restricted, the 2005 Rule requires designation of all roads, trails, and areas that are open to motor vehicle use, and prohibits motor vehicle use off the designated system.

In response to the 2005 Travel Rule, the IPNF once again undertook travel planning with the goal of designating a sustainable motorized route system for public access and recreation travel.

In 2010, the Central Zone published the IPNF's first motor vehicle use map (MVUM) as required by the 2005 Travel Management Rule, designating the roads and trails open for motor vehicle use (excluding over-snow vehicles). Once the MVUM was published, the use of motor vehicles (excluding over-snow vehicles) off designated NFS roads, trails, and areas was prohibited. The North Zone of the IPNF essentially did not allow motorized cross-country travel prior to the 2005 Travel Rule due to wildlife restrictions, vegetation and topography. Consequently, motorized access did not change with the 2005 Rule. The North Zone published their first MVUM in 2011. "The South Zone is completing a public travel planning process similar to that of the Coeur d'Alene unit."

Although the IPNF continues to offer forest visitor maps for recreation planning, the MVUMs are now the legal order reflecting where motor vehicle use (excluding over-snow) is allowed.

Motor Vehicle Use

Motor vehicle access on the Forest is managed across a range of recreation settings. For example, wilderness areas provide a primitive, non-motorized experience. Developed campgrounds and recreation sites, with high levels of development, are at the other end of the spectrum. The location of the opportunity, and the types of uses allowed, are factors that influence the kind of experiences to expect and generally align with the MA allocation. Travel management on the IPNF considers the associated MA allocation when designating a road, trail, or an area for motor vehicle use.

Travel management for designating roads, trails, and areas for motor vehicle use as required by the 2005 Travel Management Rule (36 CFR 212) (excluding over-snow vehicle use) has been completed for the Coeur d'Alene River Ranger District and the Kaniksu Zone on the IPNF. Analysis for the St. Joe Travel Management Plan is in progress. Roads, trails, and areas where motor vehicle use (excluding over-snow vehicle use) is allowed are identified on the IPNF motor vehicle use map(s) (MVUM). The MVUMs show those roads, trails, and areas designated for motor vehicle use by class of vehicle and time of year, under 36 CFR 212.51, for the purpose of enforcing the prohibition at 36 CFR 261.13. Any motor vehicle use on other than those roads, trails, and areas shown on the MVUMs is prohibited and subject to fine and/or imprisonment. The IPNF MVUMs do not designate any ***areas*** open to motor vehicle use.

The MVUMs are subject to annual review and reissuance, but changes in travel management designation for motor vehicle use (excluding over-snow vehicles) are outside the scope of this programmatic forest plan revision. Site-specific changes to types, quantities, and distribution of motor vehicle use designations continue to be determined at the district level through NEPA analysis processes.

Over-snow Vehicle Use

At this time, over-snow vehicle use is managed differently from general motor vehicle use as displayed on the IPNF MVUMs. Under the 1987 Forest Plan, over-snow vehicle use is allowed anywhere it is not expressly prohibited with a legal order (36 CFR 261.50). There is no over-snow vehicle use map used to designate where and when over-snow vehicle use is allowed. Legal orders currently in effect prohibit over-snow vehicle use on approximately 450,000 acres of NFS lands (see table 107). The areas where over-snow vehicle use is currently prohibited are: wilderness, portions of recommended wilderness, and other area closures for semi-primitive non-motorized recreation, big game habitat, or protection of specific threatened or endangered species habitat.

Table 107. Summary of Current Acres Restricted to Over-Snow Vehicle Use on the IPNF

Closure	North Zone	Central Zone	South Zone	Total
Yearlong	267,409[1]	5,705	165,010	438,124
Dec 1 thru March 31	0	0	427	427
April 1 thru June 30	10,051	0	0	10,051
March 15 thru June 30	644	0	0	644
Total	**278,104[1]**	**5,705**	**165,437**	**449,246[2]**

[1] This includes the current closure order that was imposed by the court order of November 2006 to protect Mountain Caribou.

[2] The total acreage open to winter motorized use is approximately 2,000,000 acres.

Mechanized Use

At this time, mechanized use is managed the same as over-snow vehicle use. There is no mechanized use map to designate where and when mechanized use is allowed. Under the 1987 Forest Plan, mechanized use is allowed anywhere it is not expressly prohibited with a legal order (36 CFR 261.50). Areas where mechanized use is prohibited are designated wilderness (e.g., Salmo-Priest Wilderness) and some of the special areas where pedestrian use is high (i.e., some of the cedar groves classified as botanical special areas).

Road Access – Motor Vehicle Use Designations

The current access status for motorized access on NFS roads is summarized in table 108. The table displays the total miles of roads, the miles designated for motor vehicle use yearlong, and the miles designated seasonally. The IPNF currently has about 4,133 miles of NFS roads designated for either yearlong or seasonal motor vehicle use. These roads are available for use by highway legal vehicles that meet state legal requirements.

Table 108. Summary of IPNF Roads by Travel Management Status

Total Miles of Road	Miles of Roads Designated for Yearlong Motor Vehicle Use	Miles of Roads Designated for Seasonal Motor Vehicle Use	Miles of Roads where Non-motorized Use is Allowed
8,684	3,690	443	8,684

Source – Infra: Travel Routes 2/2013

All roads (whether designated for motor vehicle use or not) on the IPNF allow non-motorized use. The actual ability to use roads by non-motorized means may be limited due to vegetation. Many roads on the IPNF have been in maintenance level 1 for many years and have re-vegetated to the point where even walking along the road prism is challenging.

Trail Access ─ Motor Vehicle Use Designations

The IPNF currently has approximately 1,573 miles of NFS trails designated for either yearlong or seasonal motor vehicle use. Table 109 displays the miles of NFS trail designated by class of vehicle. All 1,573 miles of designated trail allow hiker/pedestrian and other non-motorized use yearlong (see table 106 for additional managed uses).

Table 109. Summary of IPNF Trails Designated for Motor Vehicle Use*

	Miles of Standard/Terra Trails Designated for Motorcycles	Miles of Standard/Terra Trails Designated for ATVs or Other OHVs less than 50” Wide	Miles of Standard/Terra Trails Designated for Vehicles greater than 50” Wide
Yearlong	1,285	668	29
Seasonal	288	170	10

Source – Infra: Travel Routes 2/2013

*Total miles of designated use by class of vehicle will not sum equal to miles of trails as there may be overlapping designated uses per trail or trail segment

Area Access ─ Motor Vehicle Use Designations (excluding over-snow vehicles)

The IPNF does not allow cross-country motor vehicle use in any area.

Over-snow Vehicle Use

In winter (generally December 1 – April 30) with adequate snow cover, the Forest is generally open to over-snow vehicle use. The areas not available are the Salmo-Priest Wilderness, portions of recommended wilderness, and other area closures for semi-primitive, non-motorized recreation, big game habitat, or protection of specific threatened or endangered species habitat. Of the 2,498,000 acres of the IPNF, approximately 2,000,000 acres have no prohibition on over-snow vehicle use. Not all of the areas available to over-snow vehicles are actually used. Vegetation and topography often influence where this type of use occurs.

Road Maintenance

The objective of road maintenance is to provide for safe and efficient travel; access for administration, utilization, and protection of NFS lands; and protection of the environment, adjacent resources, and public investment (FSM 7730.2).

FSH 7709.59 62.1 describes the scope of road maintenance to include any expenditure in the repair or upkeep of a road necessary to perpetuate the road and provide for its safe use. Work items may include surface rock replacement, seal coats and asphalt overlays, bridge replacement, slide removal, and other items that contribute to the preservation of the existing road. Road maintenance is not intended to substantially improve conditions above those originally constructed; however, there may be a need for adding to or modifying the original conditions without increasing the service provided. Typical examples of this include installing additional minor culverts and traffic control devices, implementing traffic management strategies, placing small quantities of spot surfacing, and re-vegetating cut and fill slopes.

Often road maintenance is completed to maintain drainage features and surface stabilization that have been installed to follow BMPs to minimize sediment production and other pollutants for the purpose of managing water quality consistent with the Federal Clean Water Act (CWA) and state water quality programs. Forest Service policy requires the use of BMPs to control nonpoint source pollutions to meet applicable water quality standards and other CWA requirements at FSM 2532.

Road maintenance is accomplished by the Forest Service and in cooperation with other agencies and private landowners or contractors. In some cases, maintenance responsibilities are exchanged with other jurisdictions through maintenance agreements when such actions create efficiencies for both parties. Roads under road maintenance agreements with other agencies, local governments, or private organizations are maintained according to the terms of the agreement; however, this level of maintenance may not meet established agency-set standards. For cost-share roads, maintenance is commensurate with commercial uses of the road. Because jurisdiction of forest roads sometimes shifts to county or state agencies, road maintenance responsibilities are not static.

The Forests’ ability to maintain the road system is dependent on a number of factors, including:

- Total miles of open roads;
- Allocated funding for road maintenance;
- Miles maintained through commercial activities such as timber sale contracts;
- Allocated funding for road projects to support other resources;
- Assigned operational maintenance levels;
- Resource protection needs; and
- Use levels and season of use.

Road maintenance budgets fluctuate from year to year. However, traffic volumes on the Forest open road system have risen. Commercial user contributions to road maintenance have declined. This affects both recurrent maintenance, such as seasonal blading, and deferred maintenance, such as long-term surface replacement. Depending on the amount and type of traffic, the expected life of an aggregate surface can be 10 to 25 years when adequate maintenance is performed. Currently there are about 2,000 miles of aggregate surfaced road on the IPNF. Assuming an average life of 20 years, the Forest could be re-surfacing approximately 100 miles per year.

Funding has been well below that needed to annually maintain the entire road system at operational maintenance level standards. Annual accomplishment reports indicate that on average, the IPNF has been able to maintain, on an annual basis, approximately 20 percent of the open roads on the Forest (see table 110). As a result, roads are maintained on a priority basis.

User safety, resource protection, and mission needs are used to prioritize maintenance work. Ongoing travel analyses continue to identify opportunities to treat roads for intermittent stored service or decommission unneeded roads to reduce the overall road maintenance burden.

Table 110. Average Annual Road Maintenance Accomplished

Miles of Open Roads in 2012 (Op. ML 2,3,4, &5)	Average Miles Receiving Annual Maintenance Over X-year Period	Average % of Open Roads Receiving Annual Maintenance Over X-Year Period
5,009	1,296	20%

Source – Road Accomplishment Reports from 2008-2012

Roads identified during travel analysis as needed for the long term, but not needed in the short term, are often placed in a level 1 maintenance category. This level usually involves physical closure of the road for a period of 1 year or longer and sometimes includes treatment for intermittent stored service (but not decommissioning).These roads are not open for motor vehicle use until needed again.

Trail Maintenance

Although maintenance needs for trails are generally less than for the road system, allocated trail maintenance funding generally falls short of what is needed to keep all trails on the IPNF in optimal conditions for all managed uses. Partners and volunteers play a vital role in assisting with the forest trail maintenance but prioritization is necessary. Yearly trail maintenance is prioritized as follows:

- **Priority 1:** Maintenance activities that would correct an unsafe condition relative to management objective;
- **Priority 2:** Maintenance activities that minimize unacceptable resource and trail damage;
- **Priority 3:** Trail Use; and
- **Priority 4:** Maintenance activities that fully restore the trail to the planned design standard.

Table 111 displays the average annual trail maintenance accomplished on the IPNF.

Table 111. Average Annual Trail Maintenance Accomplished

Miles of Standard/Terra Trails	Average Miles Receiving Maintenance in 2011 & 2012	Average % of Trails Receiving Maintenance Over in 2011 & 2012
2,690	1,145	43%

Source – Source – Infra: Trail Module 7/2013

Recreation

The IPNF finalized its Recreation Facility Analysis Report in 2007 and developed a Recreation Niche Statement with public involvement. The niche serves as the vision for the Forest's recreation program and ensures unique attributes are maintained for future generations. The following is the IPNF recreation niche developed in 2007:

Endless Waters, Edges, and Islands

> *Emphasis:* From the shores of big lakes to the banks of winding rivers, the IPNF create a tapestry of land and water in the handle of North Idaho. The Forest has been and continues to be the lifeline for local communities. Silver, gold, and large timber drew settlers to the area. Remnant roads that once led to work now lead to play, and treasures sought are now recreational-water-based activities, winter uses and the traditional hiking, hunting, fishing, and gathering.
>
> *Forestwide Settings, Special Places, and Values:* More than half the state's surface water is on the Forest. These vast lakes and miles of rivers support a world class fishery. Rich in wildlife, the Forest is home to large game such as elk and deer, as well as species such as grizzly bears, wolves, and caribou that add to the sense of "wildness." From lush evergreen mountains to the shores of big waters, the IPNF have a rich history that continues to link families and forest. Historic cabins and lookouts dot the landscape, while significant places such as Hiawatha Trail, Marble Creek Historic District, and the Pulaski Tunnel Trail add depth to the heritage. Fire has, and continues to play an important role in the landscape's evolution. Forest roads and trails trace the past of American Indians, mining, logging, and Forest Service History. Today these roads provide easy recreational access.
>
> *Forestwide Activities/Opportunities/Experiences:* The Forest is easily accessed and has a growing and changing visitor base. Most of the visitation is local with strong ties to the Forest. Interpretation and education products weave a thread of the rich history into the visitor's experience. Traditional uses include hiking, hunting, fishing, gathering, biking, water-based camping, and boating. Recreation rental cabins and lookouts across the Forest provide overnight opportunities and a taste of history. Winter activities are snow dependent and focus on snowmobiling.

Outdoor recreation is the fastest growing use within the national forests and grasslands; a use expected to increase in the future. The latest National Visitor Use Monitoring was completed in 2009 on the IPNF (USDA Forest Service 2010 June). This monitoring program provides reliable information about recreation visitors to NFS-managed lands at the national, regional, and forest level. National Visitor Use Monitoring is a recreation sampling system that provides statistical recreation use.

Visitation is estimated through a combination of traffic counts and surveys of exiting visitors, and provides a snapshot of estimated use. Visitation estimates for 2009 on the IPNF is 1,277,700 national forest visits. Over 85 percent of these visits were from people who lived within 100 miles of the Forest. Visitors participated in the activities shown in table 112 during their visit (which also indicates visitor-identified primary activities).

Most of the visits to the Forest are day visits. The average visit to the IPNF lasts about 19 hours; however, over half of the visits to this Forest last less than 4.5 hours. Less than 5 percent of the visits involve recreating at more than one location on the Forest. Because of the local nature of the visiting population, frequent visitors are quite common. More than 22 percent of all visits are made by people who visit more than 50 times per year. Conversely, less than 30 percent of the visits are made by people who visit, at most, 5 times per year.

Relaxing is an activity for more than half the visits to this Forest, although only about 10 percent indicated it was their primary activity. Other popular activities include viewing natural features (42.7 percent), hiking/walking (40.7 percent), viewing wildlife (32.7 percent), and driving for pleasure (30.5 percent). Hunting is the most commonly identified primary activity (17.6 percent), followed by viewing natural features (10.4 percent).

Since the 1980s, both motorized and non-motorized recreation use of the roads, trails, and general forest areas have increased. Foot, horse, and mountain bike travel have increased, and to a lesser degree, cross-country and backcountry skiing and river use have increased as well.

Table 112. Visitor Participation by Recreation Activity on IPNF (FY 2009)

Activity	% of Visitors Who Participated in this Activity[1]	% Who said it was their Primary Activity[2]	Average Hours per Visit Spent in Primary Activity[3]
Backpacking	1.0	0.3	45.0
Bicycling	6.0	3.8	3.4
Cross-country Skiing	0.6	0.5	2.6
Developed Camping	9.8	4.7	55.0
Downhill Skiing	4.5	4.1	5.0
Driving for Pleasure	30.5	4.1	2.5
Fishing	11.3	7.0	6.4
Gathering Forest Products	15.8	6.3	3.9
Hiking/Walking	40.7	9.8	2.9
Horseback Riding	1.4	1.2	1.9
Hunting	20.4	17.6	9.5
Motorized Trail Activity	8.5	3.9	3.7
Motorized Water Activities	2.3	0.5	5.8
Nature Center Activities	3.4	0.3	3.2
Nature Study	5.8	0.2	4.3
No Activity Reported	0.0	0.0	
Non-motorized Water	2.2	0.7	4.0
OHV Use	4.6	0.1	6.1
Other Motorized Activity	0.4	0.0	6.0
Other Non-motorized	6.0	1.1	9.5
Picnicking	8.8	1.0	4.0
Primitive Camping	7.7	1.2	44.7
Relaxing	52.4	9.7	13.6
Resort Use	0.6	0.1	42.7
Snowmobiling	5.5	4.6	5.2
Some Other Activity	11.7	6.8	2.2
Viewing Natural Features	42.4	10.4	6.6
Viewing Wildlife	32.7	0.5	3.3
Visiting Historic Sites	4.8	0.6	1.2

[1] Survey respondents could select multiple activities so this column may total more than 100%.

[2] Respondents were asked to select one activity as their main reason for visiting; some selected more than one, so this column may total more than 100%.

[3] Computed only for those who indicated the activity was the main activity.

With increased use, recreationists are vying for quality recreation space, which may sometimes overlap in the same area at the same time. This can manifest itself in conflicts between recreationists that use non-motorized and those that use motorized modes of travel. Recreation conflicts occur when a user participating in one recreation activity negatively impacts the recreation experience of another user. In some cases, there are conflicts between non-motorized recreationist's experiences (e.g., horseback riders, hikers, and mountain bikers).

Although conflicts occur, overall satisfaction with IPNF recreation management remains high as shown in table 113 from the 2009 National Visitor Use Monitoring Survey.

Table 113. Percent Satisfaction Index[1] Scores from Recreation Users (FY 2009)

Items Rated	Satisfied Survey Respondents (%)	
	Developed Sites[2]	Undeveloped Areas (GFAs)
Developed Facilities (includes restroom cleanliness and facility condition)	85.1	81.2
Access (includes parking availability, parking lot condition, road condition and trail condition)	88.8	80.4
Services (includes availability of information, signage, employee helpfulness)	84.0	64.4
Perception of Safety	96.9	87.3

[1] This is a composite rating. It is the proportion of satisfaction ratings scored by visitors as satisfied or very satisfied. It is computed as the percentage of all ratings for the elements within the grouping that are at or above the target level, and indicates the percent of all visits where the person was satisfied with agency performance.

[2] This category includes both Day Use and Overnight Use Developed Sites.

Recreation Setting

The Forest Service uses ROS to describe different recreation experiences using setting, activities, and experience. There are six ROS classes which apply to the IPNF: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban.

In 1987, the IPNF did not quantify how many acres on the Forest were classified in the various ROS classes. Instead, the various MAs were identified as being appropriate for one or more of the ROS classes.

Current inventoried ROS maps are primarily based on existing closure areas, the IPNF MVUMs for summer ROS classifications, and the winter-groomed snowmobile route system for winter ROS classifications. The *Recreation Opportunity Spectrum (ROS) Inventory Mapping Protocol-December 2003* was used for this analysis. It defines summer ROS as May 1 through December 1, and winter ROS as December 2 through April 30. These two seasons were used as they reflect the primary recreation seasons of motorized and non-motorized opportunities. Hunting season is included in the summer season, although additional areas are closed to motor vehicle use during hunting season. The inventoried ROS summer and winter classifications are displayed in table 114.

Table 114. Forestwide Recreation Opportunity Spectrum (ROS) Area, 2010

ROS Class	Percent of Area	
	Summer	Winter
Primitive	5	5

ROS Class	Percent of Area	
	Summer	Winter
Semi-Primitive Non-motorized	53	14
Semi-Primitive Motorized	18	67
Roaded Natural	22	12
Rural	2	2
Urban	<1	<1

The ROS provides a framework for analyzing changes to recreation settings as a result of potential management activities under each alternative. The ROS can be used to estimate changes to recreation settings and experiences resulting from potential development activities. The potential effects of possible management actions on recreation settings and experiences are represented in the estimated ROS inventory shifts under each alternative.

Developed Recreation Sites

Generally, developed recreation sites have kept pace with changing demands and expectations. Developed recreation facilities include a variety of distinctly defined areas where facilities have been developed for concentrated public use, either by the Forest Service or private parties. Privately developed or managed facilities are approved by the Forest Service and are permitted under a special use authorization or partnership agreement. Redesign and reconstruction of developed sites have been ongoing with primary changes focused on updating campgrounds for RV use, improving accessibility, and improving services such as potable water and sanitation. In some cases, expansions have occurred to increase capacity. Reservation systems, host programs, and fee programs have helped keep pace with the changing demands and expectations.

Developed recreation facilities have been constructed to offer recreation experiences, protect resources, or otherwise manage concentrations of visitor activities. These facilities range from a complete campground with water systems, toilets, and fully developed sites; to a simple bulletin board or parking barrier at a parking lot. The IPNF manages a wide array of developed recreation sites, as do most other national forests across the country.

The IPNF currently manages 81 major developed recreation sites (Development Level 3 to 5), including the types and numbers of sites displayed in table 115. These numbers have changed little from what was in place when the Forest Plan was completed in 1987. The current capacity of all developed sites (Development Level 0 to 5, excluding downhill ski areas) is just over 9,796[1] persons at one time[2]. While persons at one time are a snapshot in time of the number of people who can occupy developed recreation sites, occupancy rates have generally increased over time as more recreationists are using the same number of developed recreation sites.

Campground occupancy, or demand, is based on campground host records at sites with complete records during the managed season. Not all sites have complete records. Occupancy is highest in campgrounds and day use sites adjacent to the three large North Idaho lakes (Coeur d'Alene, Pend Oreille, and Priest Lakes). In addition, because of their proximity to the urban centers of

[1] Total persons at one time from 166 developed sites on the IPNF (including all Development Scales: 0–5)
[2] A measure of facility or site designed recreation carrying capacity, particularly for developed sites. National conventions include 5 persons per family picnic/camp unit, 3.5 persons per parking lot stall at a trailhead or visitor center, 1.5 persons per motorcycle parking stall and 40 persons per tour bus parking stall.

Coeur d'Alene and Spokane, the campgrounds along the North Fork Coeur d'Alene River and Little North Fork Coeur d'Alene River are busy and experience high occupancy rates.

Table 115. Developed Recreation Sites: Number and Capacity (Development Level 3 to 5)

Sites – Public Developed	Number of Sites	Capacity – PAOT[1]
Boating Sites	10	569
Cabin and Lookout Rentals	13	82
Emerald Creek Garnet Area	1	90
Family Campgrounds	39	4,238
Fishing Areas	3	57
Group Sites or Picnic Areas	12	1,053
Swimming Areas	3	105
Total Public Developed	**81**	**6,194**

[1] – Persons At One Time (PAOT)

Dispersed Recreation

There is difficulty in meeting the array of expectations for dispersed recreation. Resources and management capability has not kept pace with the change and increase in demand. Dispersed recreation occurs on areas of the Forest outside of developed sites or general forest areas where recreation facilities, if present, are primarily designed for resource protection. Dispersed sites have little to no investment, with rustic or rudimentary improvements (barriers or signs) provided for resource protection. Visitors often seek these less developed settings to get away from crowds, and they are an important component of the Forest’s recreation niche. More people, doing more things, over larger and more diverse areas challenge the Forest’s ability to effectively manage all the various uses.

Dispersed sites are spread across the IPNF. They include: camping day use areas, access points for fishing and boating, trailheads, and larger areas used for hunting camps in the fall. A more formal inventory of dispersed sites is currently underway but will take several years to complete.

Dispersed recreation typically takes place concurrent with motorized travel. As roads, trails, and areas are restricted or closed to motorized travel, motorized use shifts from these areas and results in increases on those roads, trails, and areas that remain open to motor vehicles where a similar experience can be found. A sense of loss of freedom has occurred from the reduction of traditionally open roads available for motor vehicle access. For example, the goal to ensure threatened and endangered species security has required the Forest to adapt to evolving requirements, resulting in increases in access restrictions. These increased restrictions generate a strong reaction from forest users who are dissatisfied with the reduction in designated (open) roads available for their use.

Non-motorized user concerns revolve around conflicts with motorized users. These concerns include: noise, the smell of exhaust, dust, safety issues, wildlife displacement and harassment, and resource damage.

The 2006─2010 Idaho Statewide Comprehensive Outdoor Recreation and Tourism Plan (SCORTP) (Idaho Parks and Recreation 2006) summarize some current statistics and trends. For example, geocaching has experienced the largest percent increase of people participating in this activity (154 percent). In 2002, when the first survey was taken, most people had not even heard of the activity. Although there has probably been a significant increase in geocaching, the number of people participating is still fairly small, with only 4.8 percent of the population considered regular participants or enthusiasts. Even so, geocaching is already approaching the regular participant or enthusiast level of horseback riding (6.9 percent of Idahoans).

The Idaho State SCORTP estimated berry picking and mushroom gathering participation each increased by more than 50 percent. Perhaps this is a reflection of the local foods movement. Participation frequency of consumptive gathering, which also includes the collection of firewood, is quite high with 15.4 percent of Idahoans classified as regular participants and 5.5 percent as enthusiasts.

This same report stated participation in outdoor photography has increased significantly in recent years (44 percent). Of Idahoans surveyed in 2005, 70 percent participated in the activity of outdoor photography. Additionally, more than half of Idahoans are considered regular participants or enthusiasts. This increase is likely due to the emergence of digital photography, which makes picture taking easier and less expensive than in recent years.

According to the Idaho State SCORTP, the participation increase in ATV riding is estimated at 26 percent. Registration of ATVs and motorbikes in Idaho increased 75 percent from 2001 to 2006. However, the increase in registrations from 2002 to 2004 was 29 percent, closely matching the reported increase in participation. All partner agencies, including the IPNF and Idaho State Parks and Recreation Department, have placed additional resources into education programs and campaigns encouraging ATV riders to use their machines responsibly.

The Idaho State SCORTP discovered some interesting concerns among Idaho residents. Protecting water quality is clearly of the highest importance to Idahoans when it comes to outdoor recreation. While most of the SCORTP partner agencies have nothing to do with regulating water quality, all of them have numerous opportunities to protect and even improve it. Water quality should be a key concern when designing and constructing new outdoor recreation facilities of every type, from trails to visitor center parking lots.

In addition, the issue of access to outdoor recreation is nearly as important as water quality in the minds of Idahoans. Protecting access to existing public lands is the second most important issue, but access also shows up elsewhere on the list. Providing additional access to public lands rose to number six in 2005 from number eleven 3 years earlier. Acquiring land for recreational use and providing more access for the disabled also remain important to Idahoans. Providing more community trails is an access issue of increasing concern. At the same time, a growing awareness of the problems posed by obesity will likely result in a call for pathways connecting neighborhoods to nearby recreation sites.

Recreation Special Use Authorizations

The national forests also offer recreation opportunities in partnership with commercial and non-commercial entities by granting special use authorizations or entering into partnership agreements. These partnerships help provide recreational opportunities on national forests that the Forest Service does not directly provide. Table 116 displays the current recreation special uses permitted on the IPNF.

Table 116. IPNF Recreation Special Use Authorizations

Special Use Category	# of Authorizations
Boat Dock & Wharf	4
Campground and Picnic Ground	1
Golf Course	1
Marina	1
Outfitter and Guide	23
Park, Playground	1
Recreation Events (vary from year to year)	12
Recreation Lodging, Gov't Buildings	1
Recreation Residence	138
Resort	4
Shelter	2
Target Range	1
Winter Recreation Resort	1
Total	**190**

Source: INFRA: Special Uses Data System (SUDS) 1/2010

Scenery/Landscape Management

As area populations increase, so does visitation to area national forests. Driving for pleasure and viewing scenery have become some of the most popular national forest activities as shown from National Visitor Use Monitoring Survey data. Visitors expect a certain level of "naturalness" in the recreation and tourism settings they pursue. Even individuals who have never visited the IPNF expect a certain level of "natural intactness" in these landscapes. This natural beauty contributes to their sense of well-being and quality of life. The scenic integrity of national forest landscapes (which measures landscapes' inherent scenic attractiveness and the public's visual expectations for naturalness) is the system by which projected alterations in national forest landscapes are evaluated.

National forest visitors are attracted to a variety of areas for the natural character they possess. Visitors and residents value the forested backdrops that frame the surrounding communities. The transportation network and associated use areas provide visitors with scenic routes and vantage points to experience the region's vast expanse of rugged backcountry.

The IPNF has a variety of landscape character types created by glaciers, rivers, continental uplifting, and mass wasting. The Forest contains many areas of outstanding scenic beauty unique to the Northern Rocky Mountain Region. The American public generally recognizes that NFS lands with exceptional scenic resources are valuable public assets that should be protected and managed for the enjoyment of future generations. To some degree, most landscapes on the IPNF contain some level of alteration from past human activities, including fire, mining, logging, and ranching, even though many of these changes are not readily visible to most forest visitors. The most visible effects to scenery from past human activities have generally been caused by the removal of vegetation in patterns that contrast with the natural forms, lines, colors, and textures of the natural landscape. Forest vegetation management is generally done via timber sales or prescribed burning. Other activities that require alteration of landforms often result in more permanent changes to the landscape. Examples of these types of activities include: roads, trails, buried utilities, mines, reservoirs, communication sites, and gravel pits. Structures such as power lines, communication sites, buildings, fences, and other structures located on NFS lands also have potential to be noticeable and create negative visual changes.

National forest travel routes have been evaluated for the estimated level of public concern for alterations to the landscape. Travel routes classified as concern Level 1 (including those routes that are designated state scenic highways or national forest scenic byways) indicate that the public is most concerned about alterations; concern Level 3 indicates the least concern. In evaluating landscape visibility, landscape managers have recognized that "distance" is one of the primary perceptual factors for determining whether alterations are visually noticed. Foreground distance zones reveal even the subtlest alterations; background distance zones are able to absorb greater alterations, provided color contrasts are minimized.

Landscape management is used to meet people's scenery expectations for the management of national forest landscapes. To ensure that scenic integrity is maintained, six levels of scenic integrity objectives have been established, derived from the landscape's attractiveness and the public's expectations or concerns. Each scenic integrity objective depicts a level of scenic integrity used to direct landscape management: very high (unaltered), high (appears unaltered), moderate (slightly altered), low (moderately altered), and very low (heavily altered).

Generally, landscapes that are most attractive (as classified by scenic attractiveness class) and are viewed from popular travel routes (as classified by concern level) are assigned higher scenic integrity objectives. The methodology for establishing scenic integrity objectives is provided in Agriculture Handbook 701.

The 1987 Forest Plan utilized the Visual Management System described in the publication titled *National Forest Landscape Management* (USDA 1977). The Visual Quality Objectives shown in table 117 were established for the 1987 Plan.

Table 117. 1987 Forest Plan Visual Quality Objectives

Visual Quality Objective	Acres	% of Forest
Preservation	150,200	6%
Retention	277,600	11%
Partial Retention	880,400	36%
Modification and Maximum Modification	1,170,300	47%
Total	**2,478,500**	**100%**

In some landscapes, human influence is evident through changes in vegetation patterns, landform alterations, or the introduction of structural elements. For the most part, national forest landscapes in the planning area remain natural-appearing in character, with many of the valued landscape attributes still intact. Most of the human-influenced alterations affecting landscape scenic integrity are evident where vegetation management activities have occurred.

Environmental Consequences

Transportation System

The 1987 Forest Plan and ROD anticipated an increase in the first decade in the total number of miles of NFS roads from 6,200 miles to about 8,000 miles, with an eventual total of 9,800 miles by the end of the second decade. It also anticipated that approximately 50 percent to 60 percent of the road system would be closed to vehicle use to protect fish and wildlife habitat.

The 1987 Forest Plan prohibits new road construction in MAs 11, portions of 12, 14, and 20, or on about 241,082 acres.

For all action alternatives new road construction (permanent or temporary) would not be allowed in MA1a, 1b, 1c, 1e, 3 (Botanical, Geological, and Pioneer Special Areas), and 4a. New road construction may be allowed under certain conditions in MA2a and 2b (Wild Rivers), 3 (Recreational and Scenic Special Areas), and MA5. New road construction would be allowed after site-specific project planning in MA2a and 2b (Recreational Rivers) 4b, 6, and 7. Forestwide direction in the various resource sections would apply to road construction. Road construction in areas within inventoried roadless areas in Idaho will need to meet the requirements of the Idaho Roadless Rule. For areas within inventoried roadless areas in Washington or Montana, new road construction will need to meet the requirements in the 2001 Roadless Area Conservation Rule.

Only a minimal amount of new road construction is anticipated under the alternatives because of limited development and budgets. Under Alternatives B Modified, C, and D it is anticipated that the road system would decrease over the life of the Plan because these alternatives include an objective to decommission or place into storage 10 to 15 miles of road annually over a 5 year period (FW-OBJ-AR-03). In the Coeur d'Alene geographic area, roads decommissioned would be reviewed for both motorized and non-motorized trail opportunities (GA-DC-AR-CDA-06).

Because MA allocation would change by alternative the areas where road construction may occur would vary. Table 118 summarizes, on a forestwide basis, how the alternatives would vary. Alternative A has the greatest percentage of the Forest allowing road construction while Alternative C has the least.

Table 118. Summary of Road Construction Opportunities (by acres and percent of Forest)

	Road Construction Allowed	Road Construction Allowed w/Conditions	Road Construction Not Allowed
Alt. A	2,117,774 ac. (84%)	138,844 ac. (6%)	241,082 ac. (10%)
Alt. B Modified	1,577,298 ac. (63%)	710,734 ac. (28%)	209,668 ac. (8%)
Alt. C	1,502,010 ac. (60%)	616,621 ac. (25%)	379,069 ac. (15%)
Alt. D	1,657,210 ac. (66%)	639,921 ac. (26%)	200,569 ac. (8%)

As described in the “Affected Environment” section, there are currently about 8,700 miles of NFS roads on the IPNF. This is a result of road construction done over the last 100 years and road decommissioning done over the last 15 to 20 years. Given the backlog of decommissioning yet to be completed and the likelihood that additional roads may be identified as not being needed, it can be expected that the total number of miles of NFS roads will continue to be reduced as the Forest moves toward the minimum road network needed for safe and efficient travel and for administration, utilization, and protection of NFS lands.

Travel Management

Road and Trail Access (excluding over-snow vehicles): There are no proposed changes to current road or trail designations under any alternative of the revised Forest Plan. The number of miles of roads and trails available for motor vehicle use would be the same for the four alternatives. Although MA direction for MA1a, 1b, 1c, 1e, 2a and b (wild rivers), 3 (Botanical, Geological, Scenic, and Pioneer Special Areas), and MA4a would generally not permit motor vehicle use, existing designations as displayed on the current MVUMs remain unchanged under all alternatives.

When considering the number of acres where motor vehicle recreation opportunities exist, it is important to note that this refers only to those acres in MAs where roads or trails may be constructed and/or designated for such use. As shown in table 119, Alternative C will result in the least number of acres where routes could be designated for motor vehicle use. In comparison, Alternative D will allow about 150,100 more acres where routes could be designated for this use. This is because there will be fewer acres recommended for wilderness in Alternative D than in Alternative C. Alternatives B Modified and D will have relatively the same number of acres where roads and trails could be designated for motor vehicle use (approximately 11,000 acre difference between the two).

Motor Vehicle Use (excluding over-snow vehicles) Areas: Currently, the IPNF does not allow cross-country motor vehicle use in any area. Motor vehicle use is only allowed on those roads and trails as designated on the Forest MVUMs. As there are no proposed changes in any alternative, the number of acres available for cross-country motor vehicle use remains unchanged (0 acres).

When considering the number of acres where motor vehicle recreation opportunities exist, it is important to note that this refers only to those acres in MAs where roads or trails may be constructed and/or designated for such use. Current restrictions as shown in the MVUM remain in effect. Management areas where motor vehicle use may be allowed are MA2a or MA2b (Designated or Eligible Recreational Rivers), MA3 (Recreational Special Areas), MA 4b, MA5, MA6, and MA7. As shown in table 119, Alternative C will result in the least amount of acres where motor vehicle use on roads and trails may be allowed. In comparison, Alternatives B Modified and D have about 139,000 additional acres where motor vehicle use on roads and trails may be allowed. This is because there are fewer acres of recommended wilderness in Alternatives B Modified and D than in Alternative C. Under all alternatives, no changes will be made to current motor vehicle access without site-specific project analysis and NEPA.

Over-Snow Vehicle Use: Under the 1987 Plan, over-snow vehicle use is allowed in recommended wilderness and RNAs. Under Alternatives B Modified, C, and D this use will not be allowed. Areas allocated to recommended wilderness (MA1b), or established/recommended RNAs (MA4a) will have a legal order prohibiting over-snow vehicle use (as per 36 CFR 212.81, and 36 CFR 261.14) issued in conjunction with the ROD for the final revised Forest Plan. Areas on the Forest that are currently closed to over-snow vehicle use will also remain closed under all alternatives (see table 107 above).

Under Alternatives B Modified, C, and D, there will be a direct effect to the number of acres available for over-snow vehicle use based on the amount of recommended wilderness (MA1b) and RNAs (MA4) proposed in each. Approximately 85,800 additional acres will be closed under Alternative B Modified, 221,639 acres under Alternative C, and 81,611 acres under Alternative D.

As shown in table 119 Alternative C will result in the least number of acres available for over-snow vehicle use. Alternatives B Modified and D would result in approximately the same number of acres available for this use. These comparisons are based on MA standards and guidelines and current closed areas that would remain in affect regardless of alternative selected. Actual areas open or closed to over-snow vehicle use may vary due to closures necessary for protection of various wildlife species. These restrictions are often independent of MA designations.

Mechanized Use: Under the 1987 Plan mechanized use is allowed everywhere on the IPNF except for designated wilderness (Salmo-Priest Wilderness Area) and some of the special areas where pedestrian use is high (i.e., some of the cedar groves classified as botanical special areas). Under Alternatives B Modified, C, and D, mechanized use will be prohibited in recommended wilderness (MA1b) resulting in a direct effect on the number of acres where mechanized use is allowed. Any area that currently has no prohibition to mechanized use, and is proposed as recommended wilderness, will have a legal order prohibiting mechanized use (as per 36 CFR 261) issued in conjunction with the ROD for the final revised Plan. As shown in table 119, Alternative C will provide the least number of acres available for mechanized use due to the acreage of recommended wilderness (MA1b). Alternatives B Modified and D would provide approximately the same opportunities for mechanized use.

Table 119. Summary of Access Availability of Alternatives based on MA Prescriptions and Currently Closed Areas that will Remain Closed in all Four Alternatives

	Motor Vehicle Use May be Allowed on Routes or Trails	Allow Over-snow Vehicle Use[1]	Allow Mechanized Use
Alt. A[2]	2,399,138 ac. (96%)	2,058,281 ac. (82%)	2,485,751 ac (99.5%)[2]
Alt. B Modified	2,268,390 ac. (91%)	1,972,480 ac. (79%)	2,320,853 ac. (93%)
Alt. C	2,129,490 ac. (85%)	1,836,910 ac. (74%)	2,161,075 ac. (87%)
Alt. D	2,279,590 ac. (91%)	1,976,670 ac. (79%)	2,344,882ac. (94%)

[1] Acres shown are for areas that will be closed for most of the winter season (does not include the April 1 through June 30 closure)

[2] Acres shown allowing various uses for Alternative A are not indicative of current condition but what is allowed under the 1987 Forest Plan standards and guides under MA direction with the exception of over-snow vehicle use

Hand-held Motorized Equipment: Under the 1987 Plan and current Forest Orders, use of hand-held motorized equipment (e.g., chainsaws) is allowed everywhere on the IPNF except for designated wilderness. Under the action alternatives, use of motorized equipment is prohibited in MA1a (designated wilderness), MA1b (recommended wilderness), and MA1e (primitive area). Table 120 shows the acres by alternative where hand-held motorized equipment is not allowed. Alternative C has the most acres of recommended wilderness and would thus have the most acres with this prohibition. Alternative D has the least acres of recommended wilderness and would thus have the least acres with this prohibition. A legal order prohibiting motorized equipment, except for hand-held motorized equipment used for administrative purposes within recommended wilderness areas, will be issued in conjunction with the ROD for the revised Forest Plan.

Table 120. Acres by Alternative Where Hand-held Motorized Equipment would be Prohibited

	Alt A	Alt B Modified	Alt C	Alt D
Acres where Hand-held Motorized Use is Allowed[1]	12,000	328,400	149,900	181,800

[1] The use of hand-held equipment for administrative purposes is excluded

Road and Trail Maintenance

Road and trail maintenance (both recurrent and deferred) will continue to occur. Physical conditions will continue to be addressed through maintenance activities and be based on public health and safety, resource protection, and mission priorities. Annual operating budgets and supplemental funding will likely fluctuate with the result that maintenance accomplishments will vary from year to year.

The condition (e.g., drivability) of roads may vary between alternatives. This is mainly a result of the variability of road maintenance work that might be accomplished under the four alternatives. Since Alternative C has the least amount of acres allocated to general forest (MA6), fewer road maintenance activities may be accomplished because commercial use and associated maintenance is expected to be less. Under Alternative D, which has the most acres allocated to general forest, more commercial use might be expected and may result in the greatest amount of road maintenance.

Routine road maintenance work (brushing, grading, ditch, and culvert cleaning, etc.) is periodically performed on approximately 4,984 miles of maintenance level 2, 3, 4, and 5 roads and in most cases they are kept in a drivable condition for their designed use. Approximately 3,666 miles in maintenance level 1(which includes roads treated for intermittent stored service); however, do not receive routine maintenance work. The drivability of these maintenance level 1 roads can be expected to continue to diminish as roads re-vegetate.

Trail maintenance will not vary with alternative because funding is only dependent on allocations and partnerships, and not the level of commercial use allowed under varied MA allocations.

Recreation

Recreation Setting

The ROS acres for Alternative A in table 121 and 122 are current inventoried, or mapped, ROS condition. Mapped ROS acres are primarily determined by travel routes and terrain (specifically slope) The ROS model used the Forest's travel route inventory and digital elevation model to delineate ROS zones. Alternative B Modified, C, and D were calculated using changes in inventoried acres for MA ROS desired condition ranges. There is a direct effect to acres by ROS category by changes in MA by alternative. MAs which changed the inventoried ROS are primarily MA1b and MAs 5a, 5b, and 5c. The existing ROS as mapped (Alternative A) displays current opportunities as a result of policy, regulation, law, and site-specific analysis across the Forest.

Table 121. Percentage Summer Recreation Opportunity Spectrum by Alternative

Summer ROS Class	Percentage of IPNF Forest Acreage by Alternative			
	A	B Modified	C	D
Primitive	1%	1%	1%	2%
Semi-Primitive Non-motorized	6%	56%	58%	56%
Semi-Primitive Motorized	16%	21%	20%	20%
Roaded Natural	73%	20%	19%	20%
Rural	4%	2%	2%	2%
Total	**100%**	**100%**	**100%**	**100%**

Table 122. Percentage Winter Recreation Opportunity Spectrum by Alternative

Winter ROS Class	Percentage of IPNF Forest Acreage by Alternative			
	A	B Modified	C	D
Primitive	1%	1%	1%	2%
Semi-Primitive Non-motorized	6%	18%	23%	17%
Semi-Primitive Motorized	16%	67%	62%	67%
Roaded Natural	73%	12%	12%	12%
Rural	4%	2%	2%	2%
Total	**100. %**	**100%**	**100%**	**100%**

Site mitigations, user behaviors, user densities, site capability, design, and many other factors affect recreation experiences and may affect the natural setting (depending on facilities). Visitor use is expected to continue to increase, regardless of alternative selected, creating the need for possible management actions to maintain a mix of ROS settings as described in the “Management Area Desired Condition” section of the revised Forest Plan. Management actions might include restrictions or limitations on use, such as seasonal or yearlong closures, or actions to encourage use such as the development of additional parking at trailheads or the installation of directional or interpretive signing.

The ROS inventory is helpful in establishing baseline conditions for recreation settings. In this analysis it was used as a macro not micro management tool. ROS can be used to show the general effect of alternatives to recreation settings and opportunities over broad landscapes. While the desired condition is to provide for a range of recreation opportunities, we recognize that we will not be able to meet the demands of all recreation groups equally on the IPNF.

As part of forest plan revision, the wilderness character of roadless areas is evaluated and some are recommended for new wilderness or additions to existing wilderness designations. MA5, which comprises most of the roadless areas on the Forest, is classified as semi-primitive motorized or non-motorized. Some existing routes (primarily trails) within MA5 are designated for motor vehicle use as displayed on current MVUMs.

Developed Recreation

Alternative A – No-action Alternative

Of the 81 developed recreation sites (table 115), all are managed under MA17 under the 1987 Plan. MA17 encompasses approximately 1,700 acres. The 1987 Plan stated that existing developed recreation facilities would be expanded if demand increases beyond the capacity of the existing facilities. The 1987 Plan provides sideboards for timber harvest, recreation management, road construction and maintenance, and visual management within these areas. In general, any activity in the developed recreation areas is done to enhance a natural appearing environment and provide opportunities for social interchange between users.

Alternatives B Modified, C, and D

Under Alternatives B Modified, C, and D, 16 developed recreation sites would be managed under MA7 (Primary Recreation Areas). MA7 encompasses about 14,200 acres and includes lands associated with 4th of July, Canfield Mountain, English Point, and Lookout on the Coeur d’Alene River District; Priest Lake on the Priest Lake District; and Sam Owen on the Sandpoint District.

The desired condition in MA7 is to maintain and improve these recreation sites (MA7-DC-AR-01). Some of the developed recreation facilities are outdated and will be upgraded as funding becomes available. For example, parking spurs in many of the IPNF campgrounds are too short for modern recreational vehicles and trailers. Another example of outdated facilities includes doorways on some older toilets that are too narrow for wheelchairs. Unfortunately, any need for additional facilities is overshadowed by a shortfall in maintenance and rehabilitation funds for existing facilities and the high cost of construction. As funds have become available, the trend has been to devote resources to upgrading the larger developed recreation sites that receive high levels of use. This trend is expected to continue.

MA7 also provides management direction regarding timber harvest, recreation management, road construction and maintenance, and scenery management within these areas. Any management activities in the developed recreation areas are done to provide or improve a specific recreation experience.

Developed recreation sites outside of MA7 will continue to be managed for recreation use and improved where necessary and budgets allow. The desired condition across the Forest (FW-DC-AR-01) is to provide quality, well-maintained recreation facilities at key locations to accommodate concentrations of use, enhance the visitor’s experience, and protect the natural resources of the area. Recreation rental cabins and lookouts provide safe, comfortable, overnight facilities that allow visitors to experience and learn about the rich history of the area.

Dispersed Recreation

Effects to dispersed recreation are indirectly covered in the “Travel Management” section, described by the difference in acres available for designated motor vehicle use. The number of miles of roads and trails available for motor vehicle use (excluding consideration of over-snow vehicle use) would be the same for the four alternatives since there are no proposed changes to the currently designated route system. The number of acres available for cross-country motor vehicle use is the same for the four alternatives since there are no proposed changes to the areas currently designated for that use.

Whether or not a MA allocation allows motor vehicle use (acres where roads or trails **may** exist and be designated for such use) affects where potential dispersed use could occur. Alternative A provides the most area (96 percent), followed by B Modified (91 percent), D (91 percent), and C with the least area (85 percent).

Recreation Special Use Authorizations

In all alternatives, existing special uses would continue. Opportunities for additional recreation special uses may be affected by the alternative selected. Some recreation special uses, such as outfitter/guide operations, could be affected by the amount of area managed for semi-primitive non-motorized and primitive settings. Additional recommended wilderness acres may increase the need for traditional outfitted activities due to limitations on access. Because Alternative C has the most semi-primitive non-motorized and primitive ROS acres, it may have the greatest potential for additional types of traditional outfitter/guide operations.

No other uses are proposed in the revised Forest Plan for the areas occupied under permit for the 138 recreation residences. Current permits in all alternatives will be continued until such time as conditions change. Each permit and tract will then be evaluated and no permits for additional uses will be approved with the revised Forest Plan.

Currently, the Forest administers one concessionaire permit authorizing a private business to operate and maintain Forest Service campgrounds and one concessionaire permit authorizing a private business to operate and maintain the Hiawatha Bike Trail. Several permits authorize the operation and maintenance of resorts and one ski area on the Forest. The special uses program is large and the administration of these permitted uses will continue in all four alternatives.

No new special use authorizations are proposed in the revised Forest Plan, so there are no changes to the Recreation Special Use program in any of the four alternatives.

Scenery/Landscape Management

The quality of the visitor experience may be affected by the condition of the forest environment encountered, depending on the number and types of manmade activities and the degree of deviation from the landscape's inherent natural condition that has taken place. Each alternative will affect landscape character to varying degrees over time based on the amount of change from the natural condition that is allowed.

Alternatives C and B Modified, will enhance or protect the inherent naturalness of scenic landscapes on the highest number of acres. These alternatives will be most likely to provide the greatest public benefit and develop the most appreciation from a scenic resources standpoint.

Scenery is an integral component of all national forest settings and must be considered in the analysis for all activities on NFS land. Each site-specific project will be analyzed in detail to determine compliance with Forest Plan direction and determine if mitigation measures are required.

Scenic integrity objectives have a range from very high to low. The scenic integrity objectives for each alternative (see table 123) are based on the theme of the alternative and the mix of MAs in each alternative. Scenic class and existing scenic integrity level inventories were merged to create the composite scenery base map. Each MA has a range of proposed scenic integrity objectives as a guideline. These ranges are set to be compatible with the desired condition for the MA. The proposed scenic integrity objective categories vary by alternative based upon the allocation of the MAs.

Table 123. Percentage of IPNF by Scenic Integrity Objective Category

Scenic Integrity Objective	Percentage of IPNF Forest Acreage by Alternative			
	A1	B Modified	C	D
Very High	7%[2]	7.6%	14.9%	7.6%
Very High/High	12%[3]	2.4%	1.5%	2.0%
High/Moderate	39%[4]	29.2%	26.9%	26.9%
High to Low	42%[5]	60.5%	56.4%	63.2%
Low		0.3%	0.3%	0.3%
TOTAL	**100%**	**100.0%**	**100.0%**	**100.0%**

[1] Alternative A (No-action – 1987 Forest Plan) does not have Scenic Integrity Objectives established using the Scenery Management System. When the 1987 Plan was completed, Scenery was described using the Visual Management System (USDA Forest Service 1977) with areas of the forest classified using Visual Quality Objectives (VQO)

[2] In the 1987 Forest Plan, this was the percent assigned to the "Preservation" VQO

[3] In the 1987 Forest Plan, this was the percent assigned to the "Retention" VQO

[4] In the 1987 Forest Plan, this was the percent assigned to a "Partial Retention" VQO

[5] In the 1987 Forest Plan, this was the percent assigned to a "Modification & Maximum Modification" VQO

Consequences to Access and Recreation from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Vegetation Management

Commercial timber harvest activities will generally result in road reconstruction and continued application of BMPs on existing NFS roads. New road construction is likely to be limited and temporary road construction used as a more common method for short-term access needs.

Administrative use of gated roads that normally prohibit motor vehicle use yearlong is likely when management activities such as pre-commercial thinning, invasive weed treatments, or other non-commercial silvicultural treatments are planned.

Because general forest (MA6) allocations are lowest in Alternative C, it would generally be expected to result in the least amount of vegetation management activities and result in a lower amount of road use compared (respectively) to Alternatives B Modified, A, and D. Consequently, reduced traffic (i.e., number of vehicles on roads), both commercial and administrative, can be expected. Associated with reduced commercial use is the reduction of road reconstruction and BMP work. Road maintenance activities done in conjunction with commercial use would also occur less often since this work is only required commensurate with use.

Timber harvest has the potential to affect recreation experiences and opportunities in several ways. Short-term effects may include increased noise and dust levels; the sight of landscapes altered by differing types of harvesting; the presence of slash piles, burned areas, and roads constructed for timber sales; conflicts with logging trucks on roads used by other drivers or by bicyclists; and the removal of snow for winter log hauling from roads frequented by snowmobilers, cross-country skiers, and snowshoers. Users may be temporarily displaced to other locations because of log truck traffic, helicopter operations, and the noise from chainsaws. Visitors may be permanently displaced the longer a project or series of projects continue in the same vicinity.

Alternative D has the highest number of acres in MA6 where most of the timber harvest and other vegetation management activities will take place, followed by Alternatives A, B Modified, and C. Timber harvest and road building can create changes to the landscape, resulting in changes to ROS classifications. Alternative D has the greatest potential to convert semi-primitive settings to roaded natural settings. Alternatives A, B Modified, and C follow in descending order. Partial cutting could lessen the impacts to recreationists. Road development for timber management purposes in undeveloped areas has the potential to attract more visitors to the interior of the Forest where access had previously been limited. As use increases, visitors would experience less solitude and remoteness. Primitive and semi-primitive non-motorized settings could change to semi-primitive motorized and roaded natural settings. This change would occur only if the MVUM was changed in conjunction with vegetation management activities. Recreational benefits from timber harvest can include new roads and trails and the opportunity to gather firewood. In many cases, roads built for logging operations are then used by recreationists, although these roads typically are closed and/or decommissioned after completion of the vegetation management activity. Depending on resource objectives, some logging roads can be left open to create additional dispersed recreation opportunities.

Effects from Wildlife Management

Since wildlife management does not vary between the four alternatives, the possible consequences to access do not vary. All four alternatives include direction contained in the Northern Rockies Lynx Management Direction (USDA Forest Service 2007 March (ROD)) and the Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones (USDA Forest Service 2011 November (FSEIS and ROD)). These previous decisions will be carried forward in all four alternatives and affect locations where motor vehicle use will be allowed and limit additional opportunities for over-snow vehicle use.

Forestwide wildlife management direction (i.e., FW-GDL-WL-01, 02, 03) can directly affect motorized recreation opportunities. Restrictions that limit types of access and seasonal closures during sensitive periods; such as mating, calving, and when animals emerge from dens can temporarily displace recreationists to other areas. The IPNF MVUMs restrict motor vehicle use to designated routes yearlong or seasonally, often in response to wildlife needs. Route designations, as displayed on the MVUMs, do not change by alternative.

Recreational benefits from wildlife management could include increased hunter and wildlife viewer satisfaction, as well as maintaining angler satisfaction. The effect on recreation from wildlife management is the same for all alternatives.

Effects from Aquatic Management

Watershed improvement activities are likely to continue. The consequences to motor vehicle access can be expected to be light. One common activity is the treatment of roads to reduce the potential for sediment production and transport to surface waters, or to provide for aquatic organism passage. Actions taken might include culvert removal/replacement, out-sloping of road prisms, or the removal of unstable fills. These types of treatments, with the exception of culvert replacement, are generally done on roads that are not designated for motor vehicle use. Any roads receiving these types of treatments are often no longer drivable. On occasion these treatments may be completed on roads that are currently designated for motor vehicle (maintenance level 2, 3, 4, and 5) use, but this is expected to occur infrequently. In limited cases, roads receiving these types of treatments may be converted to trails which may allow other vehicle classes such as OHVs, UTVs, and/or motorcycles.

Recreational benefits from aquatic management could include increased satisfaction by water recreation users as well as those utilizing lakes and streams for fishing. The effect on recreation from aquatic management is the same for all alternatives.

Effects from Fire and Fuels Management

Fuels management activities (e.g., prescribed burning) are likely to continue. Administrative use of gated roads that normally prohibit motor vehicle use yearlong is likely when these management activities occur.

Fire suppression actions are also likely to continue and could result in the use of gated roads as described above. In some cases, roads that are impassible to motor vehicle use (due to re-vegetation or other restrictive condition) may be opened in order to facilitate suppression actions. These roads would probably be used for the duration of the suppression efforts and post-fire work and then returned to their previous status.

Fuels management effects on recreation are similar to the effects described under vegetation management. An increase in fire extent, creating a more visible and long-lasting change to the setting, could cause a shift in recreation use. The degree of these effects is difficult to determine and is based on the size and intensity of a wildfire event. Prescribed fire has some level of predictability for time, location, and intensity, which may decrease the short-term impacts on visitors. These effects are common to all alternatives.

Effects from Mineral and Energy Exploration, Development, and Reclamation

The Forest Service does not initiate exploration or development of mineral or energy resources. Proposals for exploration and development are driven by external parties and market forces and regulated by existing mining law. Access and road development (long-term or temporary) is often associated with mineral exploration and development, but a site-specific analysis is required prior to any approval for exploration or development activities.

If any mine reclamation activities occur, it may require the use of existing roads. These may include roads that are not currently designated for motor vehicle use. They would probably be used for the duration of the reclamation work and then returned to their previous status.

Recreation could be affected by mineral exploration and extraction in all alternatives. Non-motorized settings could potentially change to motorized settings. Short-term effects may include noise and visual impacts from open-pit or underground mining operations. In the long-term, effects may include: development from a more naturally appearing landscape; new permanent underground or open pit mines and physical structures; and new roads and road corridors constructed for mining or drilling operations that may change the recreation setting (ROS).

The potential for oil and gas development on the IPNF is low. Well sites and other facilities would affect national forest visitors depending on the location of development and the setting affected.

Cumulative Effects

Access

Access across the Forest is likely to be influenced by a variety of factors. Given the mixed land ownership (state lands, corporate timberlands) in and around the IPNF and the continuing management actions taken on these lands, there may be options for new access opportunities through cooperative and cost-share agreements.

A gradual rise in population is a general trend in the region and this often leads to increased use of forest roads and trails. The degree of change in traffic by the public will likely vary due to economic conditions (e.g., energy costs) and other demographics.

Commercial traffic (timber hauling) can be expected to fluctuate to some degree, relative to vegetation management activities. Market conditions and other external factors can often influence activity levels. These traffic conditions are usually limited to relatively small geographic areas and short periods of time. Hauling occurs more often during the summer months, but is not uncommon during the winter months as well.

Change in ownership of private lands can result in continued requests for road access across NFS lands. Depending on the circumstances, these may be requests for Forest or private road special use authorizations. Depending on the terms and conditions written into any new authorizations, opportunities for access to NFS lands may be created.

State and local government agencies with road management authority can be expected to continue to maintain their existing road network across the Forest. Some changes such as widening, resurfacing, and bridge replacements are probable but are dependent on budgets and funding allocations. The likelihood of jurisdiction of NFS roads being passed to other public road agencies is low.

Recreation

The IPNF has experienced many changes in recreation since the Forest was established, and even over the life of the 1987 Plan. Initially, recreation was light and concentrated in only a few popular areas. There were few campgrounds or other sites developed until the Civilian Conservation Corps era, when many developed sites and trails were constructed. Another major boom in recreation occurred after World War II through the early to mid-1960s, as post-war populations started heading to the national forests, demanding more and better recreation facilities.

Since the 1970s, interest in and appreciation of, the environment has increased national forest recreation visitation and has shifted activities and expectations. As temperatures increase during the summer and a majority of the Forest is free from snow cover, many people venture out onto the national forests for relief from the heat and to pursue traditional outdoor recreational opportunities.

Technical advancements in over-snow vehicles now allow winter visitors to travel many places where they were unable to travel as recently as 5 years ago. The invention of the ATV has added a new motorized use in the summer and allows many people to travel on routes into areas that they may never have been able to travel into previously. Lastly, the invention of the mountain bike has added a summer non-motorized use that was not considered when the 1987 Forest Plan was written.

All of these issues, along with several others, have led to more crowded recreation experiences during peak use times, increasing levels and range of demands on natural resources and resource managers, and more conflicts among the users themselves.

Continuing changes in equipment technology used for recreational purposes on the Forest will have impacts as new uses, or existing uses change the ease of access or areas where people recreate. These changes in uses may alter the recreational experience in some areas. Those who pursue recreation opportunities, such as hiking or back-country skiing in remote settings, will be more affected than other users.

All alternatives emphasize a mix of recreation opportunities providing today’s recreationists with reasonable assurances of future motorized and non-motorized recreational opportunities. Alternative D may provide slightly more recreation opportunities toward the developed end of the ROS classes by accelerating development of the Forest with a variety of management actions. Some values such as remoteness, solitude, and wildlife-related recreation opportunities may be reduced in Alternative D. Alternative C proposes the least amount of forest management, thereby emphasizing the primitive and semi-primitive classes of recreational opportunities.

Lands/Special Uses

Introduction

This section addresses landownership administration and adjustments and special uses of NFS lands on the IPNF.

Management of landownership includes survey and marking of landlines and other boundaries, purchase and exchange of lands with private parties and non-federal government entities, handling of title claims and other assertions of title, and acquisition of rights-of-way.

Adjustments of land ownership can occur through congressionally mandated conveyances, exchanges, and acquisitions, or through Forest Service administrative activities.

The objectives of the Forest Service landownership adjustment program (FSM 5402) are to:

- Achieve the optimum landownership pattern to provide for the protection and management of resource uses to meet the needs of the nation now and in the future;
- Avoid land use conflicts with non-federal landowners by settling land claims equitably and promptly; and
- Provide resource administrators readily accessible and understandable title information affecting the status and use of lands and resources they administer.

Land occupancy and use by private parties and other government entities is managed through the issuance of special use authorizations. Authorized special uses on the IPNF include industrial or commercial uses, private uses, and a variety of recreational uses.

All occupancy, use, or improvements on NFS lands that are not directly related to timber harvest, grazing, mining activities, and recreation are referred to as ‘non-recreation special uses.’ Typically, non-recreation special uses includes: roads, utilities, easements, storage facilities, and agricultural improvements. Recreation special uses include: resorts, ski areas, outfitter & guides, and a variety of uses that provide access to NFS lands by commercial ventures.

Use and occupancy of NFS lands may be authorized when such use is determined to be in the public interest.

Legal and Administrative Framework

The following statutory authorities govern landownership adjustments and the issuance and administration of special use authorizations on NFS lands:

Law and Executive Orders

- **Organic Administration Act of June 4, 1897 (16 U.S.C. 477-482, 551):** This act authorizes the Secretary of Agriculture to issue rules and regulations for the occupancy and use of the national forests. This is the basic authority for authorizing use of NFS lands for other than rights-of-way.
- **Transfer Act of February 1905 (33 Stat. 628):** This act transferred the Forest Reserves to the USDA.
- **Preservation of American Antiquities Act of June 8, 1906 (16 U.S.C. § 431 et seq.):** This act authorizes permits for archeological and paleontological exploration involving excavation, removal, and storage of objects of antiquity or permits necessary for

investigative work requiring site disturbance or sampling which results in the collection of such objects.

- **The Hellgate Treaty of 1855:** The Flathead, Kootenai, and Upper Pend d'Oreilles Indian Tribes reserved rights under the Hellgate Treaty of 1855 (July 16, 1855). These rights include the "right of taking fish at all usual and accustomed places, in common with citizens of the Territory, and of erecting temporary buildings for curing; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land." The federal government has trust responsibilities to tribes under a government-to-government relationship to ensure that the tribes reserved rights are protected. Consultation with the tribes in early phases of project planning helps the Forest Service meet their trust responsibilities.
- **Occupancy Permits Act of March 4, 1915 (16 U.S.C. § 497 et seq.) as amended:** This act authorizes use and occupancy on national forest land for recreational purposes including resorts and recreation residences.
- **The Mineral Leasing Act of 1920, as amended on November 16, 1973 (30 U.S.C. 185(1)):** This act authorizes the issuance of permits and easements for oil and gas pipelines. It requires annual payments in advance which represent fair market rental value and provides for reimbursement to the government for administrative and other costs incurred in monitoring, construction (including costs for preparing required environmental analysis and documentation), operation, maintenance, and termination of oil and gas pipelines.
- **General Exchange Act of March 20, 1922 (16 U.S.C. 485, 486):** This act authorized the Forest Service to consolidate its holdings in national forests where a large percentage of private lands were intermingled with forest lands. It made possible the exchange of inholdings within national forests for private lands of equal value and within the same state.
- **Bankhead-Jones Farm Tenant Act of July 22, 1937 as amended (7 U.S.C. 1010-1012):** Title III of this act directs and authorizes the Secretary of Agriculture to develop programs of land conservation and use to protect, improve, develop, and administer the land acquired and to construct structures thereon needed to adapt the land to beneficial use. Under the act, the USDA may issue leases, licenses, permits, term permits, or easements for most uses, except rights-of-way.
- **Section 7 of the Granger-Thye Act of April 24, 1950 (16 U.S.C. 490, 504, 504a, 555, 557, 571c, 572, 579a, 580c-5801, 581i-1):** This act authorizes special-use permits not to exceed 30 years duration for the use of structures or improvements under the administrative control of the Forest Service and for the use of land in connection therewith, without acreage limitation.
- **Independent Offices Appropriation Act of 1952, as amended (31 U.S.C. 9701):** This act provides authority for agency heads to charge fees for services or benefits provided by the agency that are fair and based on fair market value and cost to the Government. Office of Management and Budget (OMB) Circular No. A-25 further defines this authority and requires agencies to establish user fees based on sound business management principles.
- **Permits for Public Buildings and Other Public Works Act of September 3, 1954 (68 Stat. 1146; 43 U.S.C. 931c, 931d)**: This act authorizes permits, term permits, leases, or easements at the fair market value, not to exceed thirty-years duration, to states, counties, cities, municipalities, or other public agencies without acreage limitation for the construction and operation of public buildings or other public works, exclusive of rights-of-way.
- **Highway Act of August 27, 1958 (23 U.S.C. 317), supplemented by the Act of October 15, 1966 (49 U.S.C. 1651):** This act authorizes the Federal Highway Administration to grant

easements to States for highways that are part of the federal-aid system or that are constructed under the provision of chapter 2 of the Highway Act. The Forest Service consents to the grant of these easements in a form agreed upon by the two agencies and upon the state highway agency's execution of stipulations. This is the only authority for granting rights-of-way for projects on the federal-aid system or projects constructed under the provisions of chapter 2 of the Highway Act (FSM 2731).

- **Wilderness Act of September 3, 1964 (16 U.S.C. 1131-1136):** This act establishes requirements for special use authorizations in designated wilderness areas for temporary structures, commercial public services and access to valid mining claims and non-federal lands. Under this act, Presidential approval is necessary for the establishment of new water facilities, power projects, and transmission lines. Except for the Alaska National Interest Lands Conservation Act of December 2, 1980, this act is the exclusive authority for rights-of-way occurring within designated wilderness areas.
- **Land and Water Conservation Fund Act of September 3, 1964, as amended (16 U.S.C. 4601-6a(c)):** Section 4(c) of this act authorizes permits for recreation, such as group activities, organized events, motorized recreational vehicle use, and other specialized recreation activities of limited duration.
- **National Forest Roads and Trails Act of October 13, 1964 (16 U.S.C. 532-38):** This act authorizes the Secretary of Agriculture to grant temporary or permanent easements to landowners who join the Forest Service in providing a permanent road system that serves lands administered by the Forest Service and lands or resources of the landowner. It also authorizes the grant of easements to public road agencies for public roads that are not a part of the federal-aid system (FSM 2732).
- **Sisk Act of December 4, 1967, as amended (16 U.S.C. 484a):** This act authorizes the exchange of lands with states and local governments.
- **The Act of November 16, 1973 (30 U.S.C. 185):** This act, amending Section 28 of the 1920 Mineral Leasing Act, authorizes the Forest Service to issue authorizations for oil and gas pipelines and related facilities located wholly on NFS land. When the lands are under the jurisdiction of two or more federal agencies, authority for issuance is reserved to the USDI, BLM, subject to approval by the agencies involved.
- **Federal Land Policy and Management Act of October 21, 1976 (43 U.S.C. 1761-1771):** Title V of the Federal Land Policy and Management Act (FLPMA) authorizes the Secretary of Agriculture to issue permits, leases, or easements to occupy, use, or traverse NFS lands. FLPMA directs the United States to receive fair market value unless otherwise provided for by statute and provides for reimbursement of administrative costs in addition to the collection of land use fees (43 U.S.C. 1764(g)).
  - a. Except in designated Wilderness Areas, Alaska, and specifically excepted situations, FLPMA is the only authority for all forms of use involving:
    - (1) Transportation, distribution, or storage of water;
    - (2) Transportation, distribution, or storage of liquids or gases other than water and other than oil, natural gas, synthetic liquid, or gas fuels, or their refined products;
    - (3) Transportation of solid materials and associated facilities for storing such materials;
    - (4) Generation, transmission, and distribution of electrical energy;
    - (5) Transmission or reception of electronic signals and other means of communication;

    - (6) Transportation facilities outside of wilderness, except those rights issued in connection with commercial recreation facilities, authorized by the Federal Highway Act (FSM 2731), or the National Forest Road and Trail Act (FRTA) of October 13, 1964 (FSM 2732). The FLPMA is also used for granting rights-of-way to those otherwise qualified for FRTA easements, but who elect to pay a road-use fee at the time of commercial hauling instead of paying their share of road costs at the time the easement is issued. For further direction of FLPMA road rights-of-ways see FSM 2733; and
    - (7) Other transportation systems or facilities that are in the public interest, including those that would arise from future technological advances.
  - b. Section 504g of Title V (Public Law 98-300) exempts facilities financed through the Rural Electrification Administration from federal land use fees. This section also provides for recovery of administrative costs from those uses.
  - c. Section 501(b)(3) of Title V (Act of October 27, 1986; 100 Stat. 3047; commonly referred to as "Colorado Ditch Bill") expanded the authority of the Secretary of Agriculture to:
    - (1) Issue free conditional easements for certain water conveyance systems crossing NFS lands;
    - (2) Authorize lump-sum payments for uses on NFS lands; and
    - (3) Administer uses on NFS lands authorized under previous acts that were granted or issued by the Secretary of the Interior.
- **American Indian Religious Freedom Act of August 11, 1978 (42 U.S.C. 1996):** This act states the policy of the United States to preserve and protect the rights of Native Americans to reasonable access and use NFS lands for exercising their traditional cultural religious beliefs and practices. This act does not grant authority to issue authorizations.
- **Archeological Resources Protection Act of October 31, 1979 (16 U.S.C. 470aa):** This act authorizes the Secretary of Agriculture to issue permits for archeological research, investigations, studies, and excavations.
- **Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C 3210):**
  - a. The Alaska National Interest Lands Conservation Act (ANILCA) provides numerous authorities related to access that are specific to national forests in Alaska (except for sec. 1323(a), which applies to all NFS lands; see the following paragraph b). The Regional Forester, Region 10, shall prepare Manual supplements providing necessary direction for Alaska.
  - b. The provisions of section 1323(a) (16 U.S.C. 3210) apply to all NFS lands. This section provides that, subject to terms and conditions established by the Secretary of Agriculture, the owners of non-federal land within the NFS shall be provided adequate access to their land. Regulations implementing section 1323(a) are set forth at Title 36, Code of Federal Regulations, Part 251, and Subpart D - Access to Non-Federal Lands. See FSM 2701.3, paragraph 3, for the summary of the provisions of 36 CFR 251, Subpart D.
- **Small Tracts Act of January 12, 1983 (16U.S.C. 521c-521i):** This act authorizes the sale, exchange, or interchange of certain parcels of minimal size.
- **Federal Timber Contract Payment Modification Act of 1984 (16 U.S.C. 618):** Section 3 of this act authorizes a waiver of all or part of a land use fee for an organizational camp operated by the Boy Scouts of America or other nonprofit organizations when they provide

services the authorized officer determines are a valuable benefit to the public or programs of the Secretary of Agriculture.

- **Ditch Bill Act of October 27, 1986 (P.L. 99-545):** This act amended FLPMA to authorize permanent easements for agricultural water systems.
- **Omnibus Parks and Public Lands Management Act of 1996 (16 U.S.C. 497c):** Section 701 of this act:
  - a. Establishes a system to calculate fees for ski area permits issued under the National Forest Ski Area Permit Act of 1986, (16 U.S.C. 497b);
  - b. Provides for holders of ski area permits issued under other authorities to elect this permit fee system (FSH 2709.11, sec. 38.03a);
  - c. Includes provisions concerning compliance with NEPA when issuing permits for existing ski areas (FSM 2721.61f and FSH 2709.11, sec. 41.61b); and
  - d. Withdraws leasable and locatable minerals, subject to valid existing rights (FSH 2709.11, sec. 41.61c).
- **Act of May 26, 2000 (16 U.S.C. 406l-6d):** This act supplements the authority of the Secretary of Agriculture to regulate commercial filming and still photography on NFS lands. It also authorizes the Secretary to retain and spend land use fees collected for commercial filming and still photography without further appropriation, and provides for recovery of administrative and personnel costs in addition to the collection of the land use fee.
- **Executive Order 13007 of 1996, Indian Sacred Sites:** This order acknowledges the role of federal agencies to protect and preserve the religious practices and places of federally-recognized tribes and enrolled tribal members. It also requires agencies to consult with federally-recognized tribe to address tribal concerns for sacred sites on public land and to ensure access to religious places and avoidance of adverse effects to sacred sites in accordance with existing legislation.
- **Executive Order 13175 of 2000, Consultation and Coordination with Indian Tribal Governments:** Provides direction for consultation with Tribal governments for formulating or implementing policies that have tribal implications. Also provides direction regarding consultation and coordination with Indian Tribes relative to fee waivers. Calls upon agencies to use a flexible policy with tribes in cases where proposed waivers are consistent with applicable federal policy objectives. It directs agencies to grant waivers in areas where the agency has the discretion to do so, when a Tribal government makes a request. When a request is denied, the agency must respond to the tribe in writing with the rationale for denial.
- **Cabin User Fee Fairness Act of 2000 (16 U.S.C. 6201-6213) as set out in title VI of the appropriations act for the USDI and Related Agencies for Fiscal Year 2001 (Pub. L. 106-291):** This act establishes procedures for appraising recreation residence lots and determining fees for recreation residence lots located on NFS lands.
- **National Forest Organizational Camp Fee Improvement Act of 2003 (16 U.S.C. § 6231 et seq.):** This act establishes a land use fee system for organizational camps located on NFS lands and authorizes the Secretary to retain and spend these fees without further appropriation. The act also exempts certain ministerial actions from the provisions of the NEPA.
- **Tribal Forest Protection Act of 2004:** This act authorizes the Secretary of Agriculture to enter into an agreement or contract with Indian tribes to carry out projects on lands bordering or adjacent to Indian forest land to protect Indian forest land.

Code of Federal Regulations (CFR)

The following regulations provide direction for special uses management on NFS lands:

- **36 CFR 251 –** Land Uses
  - Subpart A: Miscellaneous Land Uses
  - Subpart B: Special Uses
  - Subpart C: Appeal of Decisions Relating to Occupancy and Use of NFS Lands
  - Subpart D: Access to Non-federal Lands
  - Subpart E: Revenue-producing Visitor Services in Alaska
- **36 CFR 254 –** Landownership Adjustments
  - Subpart A: Land Exchanges
  - Subpart B: National Forest Townsites
  - Subpart C: Conveyance of Small Tracts

Key Indicators

- Acres of NFS land administered; and
- Number of special use authorizations.

Methodology and Analysis Process

The number of acres of NFS lands currently administered by the IPNF and number of special use authorizations currently in effect would be compared to changes that would result from implementation of any of the alternatives considered.

The total acres of NFS lands are derived using a GIS measuring process. The total is comprised of lands under Forest Service jurisdiction both within and outside of the proclaimed NFS boundary. The total acres of non-NFS lands are provided by the Washington Office Lands group and are only those lands within the proclaimed NFS boundary. The data source for the number of special use authorizations is the national special uses data system.

Affected Environment (Existing Condition)

Lands

There are approximately 2,497,700 acres of NFS lands that are the administrative responsibility of the IPNF. This is the result of the original congressionally designated lands and the conveyances (acquisitions, disposals, and exchanges) that have occurred to date.

The IPNF landownership pattern varies with location (see figure 34).

The pattern can be characterized as:

- Large blocks of uninterrupted, contiguous NFS lands;
- Checkerboard situations with alternate sections of private and NFS lands;
- Isolated tracts of private lands surrounded by NFS lands;
- Isolated tracts of NFS lands surrounded by private lands; and
- Large blocks owned by corporate landowners.

Within the proclaimed boundary of the IPNF there are approximately 440,000 acres of non-NFS lands. These non-NFS lands are comprised of state and local government, other agency, corporate and private ownership; and large water bodies.

The IPNF have administrative responsibility for surveying and marking of approximately 2,990 miles of landline.

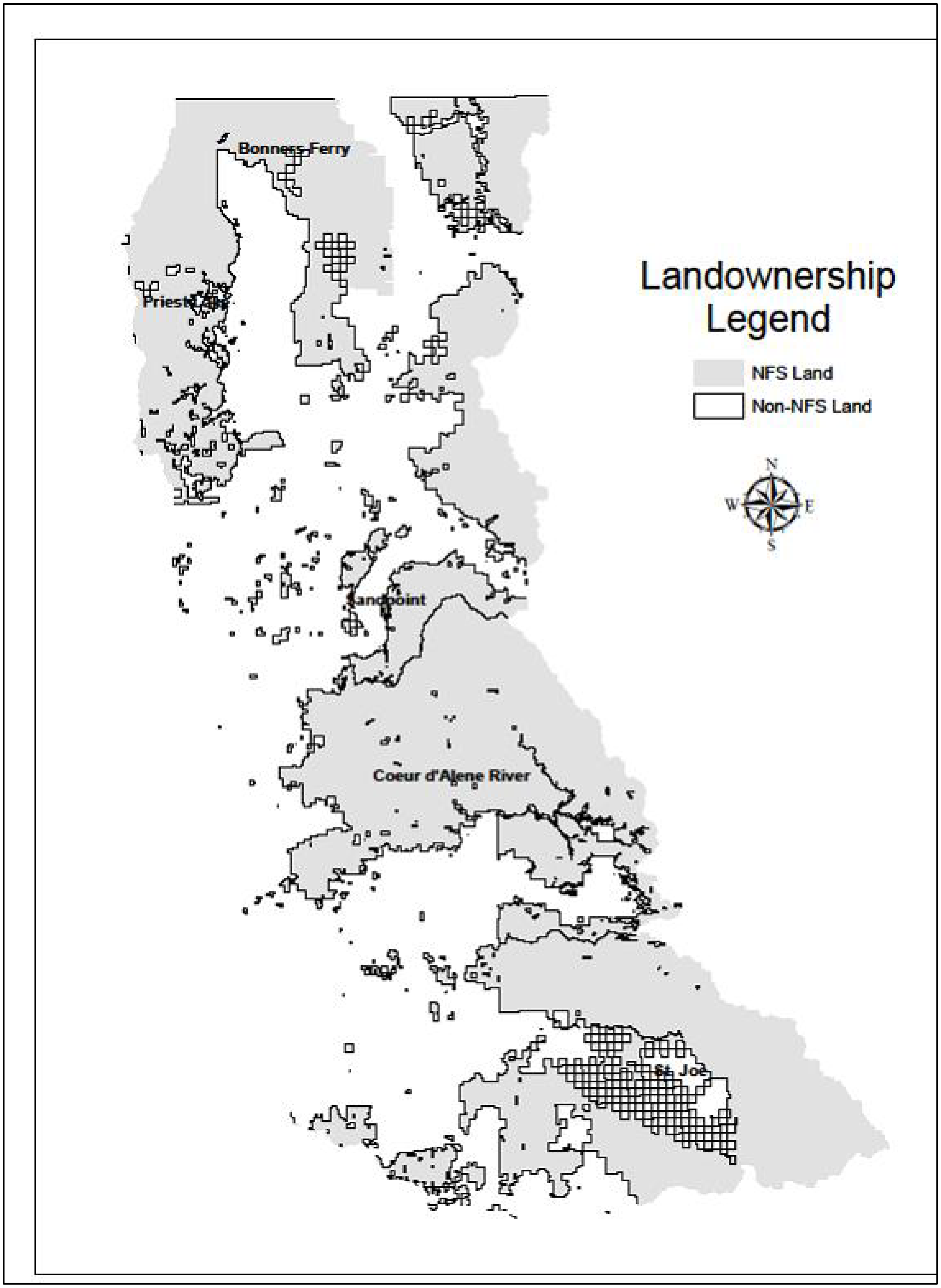


Figure 34. Idaho Panhandle National Forest Landownership Pattern

Special Uses

Special use authorizations permit occupancy and use on NFS lands by federal, state, and local agencies, Indian Tribes, private industry, and individuals. Non-recreation special uses vary from low-intensity, often short-term actions such as filming or locations for scientific instruments, to larger developed facilities such as roads, communication sites, dams, and utility/energy transmission infrastructure.

Currently, there are about 590 non-recreation special use authorizations in effect. Table 124 summarizes the number of current authorizations by category.

Close to 53 percent of all authorizations are related to roads (DOT easements, FRTA easements, FLPMA easements and permits). The next closest category is for recreation residences which account for about 18 percent of current authorizations. Almost 10 percent of permits on the IPNF are for water transmission or diversion. The remaining 19 percent of authorizations are spread through all the other categories.

Table 124. Summary of Non-recreation Special Use Authorizations

Special Use Category	# of Permits
Airport, Heliport	1
Broadcast Translator/Low Power TV & FM	3
Building	1
Cable Television	1
Cellular	1
Corral, Pen, and Livestock Area	1
Cultivation	1
Disturbing Use, 1979 Act	1
DOT Easement	25
Experimental and Demonstration	2
Facility Manager	1
Federal Land Policy & Mgmt Act Easement	33
Federal Land Policy & Mgmt Act Permit	116
Fence	1
Fiber Optic Cable	7
Forest Road and Trail Act Easement	232
Historic Building and Improvement	1
Hydroelectric Project, FERC Licensed	2
Irrigation Water Ditch	1
Irrigation Water Trans Pipeline <12” D	3
Liquid Waste Disposal Area	1
Livestock Area	7
Microwave-Common Carrier	5
Microwave-Industrial	4
Mineral Material Sale	4
Natural Gas Pipeline - FERC	2
Navigation Aid (beacon, buoy, & others)	1

Special Use Category	# of Permits
Navigation Aid, Lighthouse	2
Nondisturbing Use	2
Other Community Improvement, not REA	1
Passive Reflector	5
Powerline	12
Powerline, REA Financed	5
Private Mobile Radio Service	2
Processing Plant	1
Research Study	2
Residence	1
Residence, Government Owned Building	3
Resource Monitoring Site	1
Service Building	4
Sewage Transmission Line	5
Sign	2
Solid Waste Disposal Area	2
Stockpile Site	1
Stream Gauging Station	3
Telephone and Telegraph Line	3
Television Broadcast	1
Water Conveyance Easement, PL 99-545	4
Water Diversion, WEIR	1
Water Storage Tank	2
Water Trans Pipeline < 12" D	60
Water Trans Pipeline >=12” D	2
Weather Station	1
Well, Spring, or Windmill	3
Grand Total	**589**

Source: INFRA: Special Uses Data System (SUDS) 10/2010

Environmental Consequences

General Effects

Alternative A – No-action Alternative

This alternative reflects the 1987 Forest Plan, as amended to date, and accounts for current laws and regulations that have been promulgated since the original Forest Plan and the amendments were adopted. The 1987 Forest Plan recognized the desirability of adjusting landownership in order to improve manageability of NFS lands. This alternative does not propose to acquire or dispose of any lands but did identify (in appendix 9 of the 1987 Forest Plan) land ownership planning criteria that helps prioritize lands to be acquired and lands that were available for disposal. This alternative does not propose any changes to existing special use authorizations.

Alternative B Modified, C, and D

None of the alternatives proposes to make any site-specific changes to the existing landownership on the IPNF. No conveyances (acquisitions, disposals, or exchanges) are proposed. These actions would only be considered at the project level. Until an external entity presents a proposal there would be no changes to the existing landownership pattern.

Since no changes in landownership are proposed, the number of acres of NFS lands remains the same for all four alternatives.

None of the alternatives proposes to make any site-specific changes to existing special use authorizations or rights-of-way on the IPNF.

Since no changes in special use authorizations or in rights-of-way are proposed, there is no difference between Alternatives A, B Modified, C, or D.

Consequences to Lands and Special Uses from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Management Area Prescriptions

Some MA allocations, such as NFS lands which have not been statutorily designated for a specific use (e.g., MA1b – Recommended Wilderness, MA2 – Eligible Wild and Scenic Rivers) or lands that have been administratively designated for a specific use (e.g., MA3 – Special Areas, MA4 – Research Natural Areas) are less likely to be considered for disposal or exchange. Based on MA allocation, Alternative C would have the greatest number of acres that would be less likely to be considered for disposal or exchange, followed by Alternative B Modified, D, and A.

Similar to lands, some special uses authorizations are less likely to be considered in MA1b, MA2, MA3, or MA4. Based on MA allocations, Alternative C would have the greatest number of acres that would be less likely to be considered for special use authorizations, followed by Alternative B Modified, D, and A.

Effects from Vegetation Management

Vegetation treatments tend to impact the appraised value of NFS lands. Depending on the type of treatment the value may decrease or increase. Since Alternative D has the most likelihood of vegetation treatments, it is most likely to result in fluctuations in land values, followed by Alternative A, B Modified, and C.

Effects from Wildlife Management

National Forest System lands that provide secure habitat or contribute as linkage areas are less likely to be considered for disposal or exchange. The impact is the same for the four alternatives since the lands where these conditions exist does not vary between the alternatives.

Effects from Recreation Management

National Forest System lands with developed recreation sites (e.g., campgrounds) are less likely to be considered for disposal or exchange.

Cumulative Effects

Cumulative effects evaluate the potential impacts to NFS lands and special uses from the proposed action when combined with past, present, and reasonably foreseeable actions. The lands within the IPNF boundary form the geographic scope for cumulative effects since this is the scope for the proposed action (Alternative B Modified). The temporal bound would be the life of the Forest Plan which is estimated to be a 15 year time span.

In order to understand the contribution of past actions to the cumulative effects of the proposed action, existing conditions are used as a proxy for the impacts of past actions. This is because existing conditions reflect the collective impact of all prior actions that have affected landownership and special uses and might contribute to cumulative effects.

One multimodal utility corridor was established on the IPNF through a programmatic Forest Plan Amendment in November of 2008 with the completion of the *Final Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Lands in the 11 Western States* (DOE/EIS-0386) that established corridor 229-254 (EIS Volume III Map D2). This corridor is adjacent to I-90 and traverses through NFS lands on the IPNF in several locations. Corridor width is specified as 3,500 feet in this EIS. Portions of this corridor are unoccupied at this time.

Landownership and special uses can be expected to be influenced by a variety of factors.

As described in the “Affected Environment” section, the IPNF have administrative responsibilities for 2,497,700 acres of NFS lands. Currently, the IPNF are working on several small land adjustment cases but no large land exchanges or adjustments. In recent years, external entities have made land acquisitions and have transferred ownership to the national forests; and it is likely that these types of actions will continue. Any change (increase or decrease in total NFS lands) is dependent on what actions might be initiated. Outright purchase and transfer would most likely result in an increase of total NFS lands. Land exchanges, on the other hand, may result in a decrease in the acres of NFS lands.

The Forest can expect requests for special use authorizations to continue. As more private land is subdivided there is usually an associated increase in requests for road special use permits and utility easements. Requests for modification of existing authorized communication sites and designation of new communication sites can reasonably be expected as technological advances (e.g., cell phones) are made. On the IPNF these sites typically occupy small acreages (1 to 2 acres).

Landline survey and marking will continue and occasional encroachments are likely to be discovered.

Inventoried Roadless Areas

Introduction

Inventoried roadless areas are undeveloped areas typically exceeding 5,000 acres that meet the minimum criteria for wilderness consideration under the Wilderness Act. Roadless area inventories were initially identified during the Roadless Area Resource Evaluations of 1972 (RARE I) and 1979 (RARE II). The 1987 IPNF Plan EIS, appendix C, included 48 IRAs identified by name, number, and acres.

These 48 roadless areas are distributed across the Forest comprising approximately 850,000 acres of undeveloped area. These areas provide a range of primitive and semi-primitive recreation opportunities. Roadless area recreation levels vary from low to moderate depending upon their location. Use levels tend to be lower than the developed portions of the Forest where roads allow easier access to developed and dispersed recreational opportunities. The roadless areas provide a myriad of other resource benefits including undeveloped fisheries and wildlife habitat, biological diversity, and sources for high-quality water.

Public opinions regarding the use of these areas vary greatly; and future management of roadless areas is a controversial and polarized issue. Management direction for IRAs has been proposed in the revised Forest Plan and for each alternative. IRAs within the state of Idaho (which is the majority of IRAs on the Forest, covering approximately 797,100 acres) are managed under the Idaho Roadless Rule of 2008 (36 CFR 294 Subpart C). While a management allocation may allow development activities such as vegetation management in a roadless area, it does not require it. Such activities may be proposed, but must be further evaluated in site-specific NEPA prior to approval and implementation.

Each roadless area is evaluated through the forest planning process to determine if it provides wilderness characteristics and whether or not it should be recommended for wilderness. Areas not recommended for wilderness may still be considered for wilderness by Congress. Impacts on the inherent wilderness character, its undeveloped nature, its naturalness, the opportunity to provide primitive and unconfined recreation, and its natural ecosystem forces could detract from future consideration of the area as wilderness. This analysis evaluates the effects of the proposed Plan and alternatives on roadless characteristics. This evaluation considered the criteria and process for evaluating potential wilderness found in FSH 1909.12, Chapter 70, Wilderness Evaluation.

Legal and Administrative Framework

Law and Executive Orders

- **The Wilderness Act of September 9, 1964 (16 U.S.C. 1131(note), 1131-1136):** This act gives the statutory definition of wilderness (Section 2(c)) which helps define the evaluation process for potential wilderness in this planning process.
- **Memorandum 1042-1564:** Secretary of Agriculture Vilsack reserved decision authority for projects in inventoried roadless areas involving road construction/ reconstruction or the cutting, sale or removal of timber, as re-authorized.

Code of Federal Regulations (CFR)

- **36 CFR 219.27:** Special Designations - (b) Wilderness Area Reviews states: “Unless federal statute directs otherwise, all undeveloped areas that are of sufficient size as to make practicable their preservation and use in an unimpaired condition must be evaluated for recommended wilderness designation during the Plan revision process. These areas may be evaluated at other times as determined by the responsible official."

- **Idaho Roadless Rule (36 CFR 294 Subpart C):** Provides state-specific direction for the conservation of inventoried roadless areas in the national forest within the state of Idaho.

Key Indicator

- Number of acres recommended for wilderness, by alternative.

Methodology and Analysis Process

Inventory of Roadless Areas for Forest Plan Revision

When revising forest plans, national forests are required to evaluate roadless areas, consider their wilderness characteristics, and to make recommendations to Congress regarding areas suitable for inclusion into the National Wilderness Preservation System. The Forest Service can only recommend wilderness allocations to Congress via Forest Plans. Only Congress can designate wilderness through the legislative process. The first step in the evaluation of potential wilderness is to identify and inventory all roadless areas within NFS lands that satisfy the definition of wilderness found in section 2(c) of the 1964 Wilderness Act.

Criteria for determining whether an area of NFS land qualifies as an IRA are provided in Forest Service Handbook 1909.12 (71.1), which states: "Areas qualify for placement on the potential wilderness inventory if they meet the statutory definition of wilderness. Include areas that meet either criteria 1 and 3, or criteria 2 and 3 below."

1. Areas contain 5,000 acres or more.

2. Areas contain less than 5,000 acres, but can meet one or more of the following criteria:

    a) Areas can be preserved due to physical terrain and natural conditions;
    b) Areas are self-contained ecosystems, such as an island, that can be effectively managed as a separate unit of the National Wilderness Preservation System; or
    c) Areas are contiguous to existing wilderness, primitive areas, Administration-endorsed wilderness, or potential wilderness in other federal ownership, regardless of their size.

3. Areas do not contain forest roads (36 CFR 212.1) or other permanently authorized roads, except as permitted in areas east of the 100th meridian (sec. 71.12).

Inventoried roadless areas may contain improvements such as motorized trails, unauthorized and user-created roads, fences, outfitter camps, and evidence of historic logging activities. The identification of potential wilderness inventory does not constitute a land designation, nor does it imply any particular level of management direction or protection. It is completed with the express purpose of identifying all lands that meet the criteria for being evaluated for wilderness suitability and possible recommendation for inclusion in the National Wilderness Preservation System.

Evaluation for Wilderness Potential

The next step in potential wilderness evaluation is to determine the mix of land and resources uses that best meet public needs. An area recommended as suitable for wilderness must meet the test of capability, availability, and need. In addition to the inherent wilderness quality it possesses, an area must provide opportunities and experiences that are dependent upon and enhanced by a wilderness environment, and the ability of the area to be managed as wilderness.

The IPNF suitability evaluation (capability, availability, and need) of the potential wilderness inventory (IRAs) was made public in 2006 as part of the forest planning process. These evaluations indicate the inherent wilderness quality of each roadless area.

The IRAs were evaluated for suitability for potential wilderness with the test of capability, availability, and need as follows:

- **Capability –** The capability of a potential wilderness area is the degree to which that area contains the basic characteristics that make it suitable for wilderness recommendation without regard to its availability or need as wilderness. This includes environmental as well as manageability considerations.
- **Availability –** The determination of availability is conditioned by the value of and need for the wilderness resource compared to the value of and need for other resources. Other resource demands and uses were evaluated. Constraints and encumbrances were also reviewed to determine the degree of Forest Service control over the surface and subsurface area.
- **Need –** This is an analysis of the degree to which the potential wilderness area would contribute to the overall National Wilderness Preservation System. This evaluation was conducted at the regional level.

The Wilderness Needs Assessment was completed in 2003 for the USDA Forest Service Northern Region. Need is described as the degree to which an area contributes to the local and national distribution of wilderness (FSH 1909.12, 72.3a). The Northern Region assessment included social and ecological factors.

The designation of additional wilderness acreage in the region could provide a greater level of habitat security for additional plants that are rare at the global or state level according to the state Natural Heritage Programs. The IPNF are included primarily in the Bitterroot Mountains and Okanogan Highlands Ecological Sections. Significant increases in under-represented cover types would be gained by the inclusion of various roadless areas into wilderness designations within these sections (USDA Forest Service 2003c). Under-represented types on the IPNF are western redcedar, western hemlock, forested riparian, aspen, ponderosa pine, riparian shrublands, and grasslands.

Changes between Draft and Final

Changes were made to the boundaries of two recommended wilderness areas under Alternative B Modified. In response to public comment, approximately 23,100 acres were added to the Mallard Larkins and 1,000 acres subtracted from the Salmo-Priest recommended wilderness areas.

Changes were made to the boundaries of two recommended wilderness areas under Alternative B Modified. In response to public comment, approximately 23,100 acres were added to the Mallard Larkins and 1,000 acres subtracted from the Salmo-Priest recommended wilderness areas. The addition to Mallard Larkins was to restore the designation from the 1987 Forest Plan of recommended wilderness for this area. Alternative B of the DEIS had this portion of Mallard Larkins allocated to MA3, Pioneer Special Area. The management direction for this MA was similar to recommended wilderness, but without the distinction of being recommended as wilderness. Because this area has been recommended since the 1987 Plan, it was decided to continue the allocation of recommended wilderness under Alternative B Modified. The change to the Salmo-Priest recommended wilderness area was to remove the Upper Priest River botanical special area and a portion of the Upper Priest River eligible wild river from recommended wilderness, reducing the number of overlapped MAs in that area and allowing mechanized use to continue on a popular mountain biking trail under Alternative B Modified.

Definitions, minor edits, and clarifications have been made throughout the section.

Affected Environment (Existing Condition)

Inventory of Roadless Areas

The1987 Plan identified 48 IRAs with a total of 853,800 acres. Few updates were provided for the 2000 Roadless Area Conservation EIS from information that was in the 1987 Forest Plan. The 2000 Roadless Rule referenced a total of 825,300[1] acres. When the revision process was started in 2001, the IPNF updated its inventory of roadless areas and acres on the Forest. There had been changes in some of the roadless areas from management activities that had occurred where 1987 Forest Plan MA allocations had allowed development. Roadless acreages changed due to these refinements in the boundaries and use of new technology (GIS) to determine acreages of these areas. The update retained the same 48 IRAs from the 1987 Forest Plan but the acreage was revised to 849,305 acres. These acres were again reviewed in 2005 and updated to total 847,974 acres. Most of the change in acreage was due to an accounting adjustment, where the area covered by Priest Lake (the water) was no longer included in NFS ownership acres. Acres were adjusted again in 2007, with an adjustment to the Skitwish Ridge IRA. Acres were also updated for changes in land status, with additions to NFS acres in the Grandmother Mountain IRA from a land exchange with BLM. IRAs total 850,999 acres.

Evaluation for Wilderness Potential

Each of the 48[2] roadless areas was evaluated to determine its potential for wilderness designation. All IRAs were assessed for capability and availability. A need analysis was then completed. Appendix C contains details of the IRA evaluations. Opportunities and experiences one would expect to find and manageability of an area was incorporated to determine which IRA’s were suitable for potential inclusion in the National Wilderness Preservation System. Descriptions of the specific roadless areas (within Idaho) are contained in volume 3, appendix C of the Roadless Area Conservation Final EIS for NFS Lands in Idaho (USDA Forest Service 2008a).

In addition to inherent wilderness quality, an area must provide opportunities and experiences that are dependent or enhanced by a wilderness environment, and the manageability of the area as a wilderness should be considered (FSH 1909.12, 72). Other considerations in determining suitability include: size and shape of the IRA, location in relation to other IRAs or designated

[1] This total excluded portions of the St. Joe W&S River where it flowed through the Mallard Larkins and Meadow Creek Roadless Areas. The acreage would be 838,300 with the St. Joe W&S River included.
[2] The Gilt Edge-Silver Creek roadless area (#792) lies mostly on the Lolo NF and was not rated because only 200 acres of this 11,000 acre Roadless area lies within the boundaries of the IPNF.

wilderness, adjacent property, adjacent forest's evaluation, public comments, social and economic considerations, or administrative recommendations.

Four areas which *rated* as suitable for wilderness designation were determined to not be suitable and not recommended for designation in any alternative. Reasons for this varied from identified public concerns, adjacent private lands, unmanageable boundaries, existing recreation uses (summer motorized use on trails, or over-snow vehicle use), white bark pine restoration needs, or watershed/fish restoration needs. Conversely, three areas were recommended in one or more alternatives that were not *rated* as suitable for wilderness designation. The reasons for adding these areas as recommended wilderness is because of an adjacent forest's evaluation or how several of these areas form logical blocks of land when grouped together to form larger contiguous areas for recommended wilderness.

For example, the Northwest Peaks roadless area was rated high in two categories and moderate in another. It was determined not to be suitable based on concerns from the public raised during the collaborative process. The majority of Northwest Peaks roadless area is allocated to MA3 (special areas) in all three action alternatives to maintain its unique character and allow for existing uses to continue. See appendix C for detailed ratings, and suitability for potential wilderness recommendation.

Portions of all twelve roadless areas grouped in six areas on the IPNF were identified as capable and available for recommendation as potential wilderness (see table 125). These areas total 331,005 acres or approximately 13 percent of the IPNF.

Table 125. Potential Wilderness Inventory Rated Suitable as Recommended Wilderness

Roadless Area			Potential Wilderness	
Name	**#**	**Total Area Acres**	**Acres[1]**	**Name**
East Cathedral	131	22,347	22,422	Cathedral Peak – Total Acres = 71,334
Magee	132	34,812	34,811	
Spion Kop	136	22,391	8,915	
Tepee Creek	133	5,187	5,186	
Grassy Top	982	13,629	13,582	Grassy Top – Total Acres = 13,582
Mallard Larkins	300	129,439	82,610	Mallard Larkins – Total Acres = 134,726
Meadow Cr-Upper N Fork	302	6,024	5,816	
Mosquito-Fly	150	19,404	19,404	
Sheep Mtn-State Line	799	27,743	26,896	
Salmo-Priest	981	20,021	29,078	Salmo-Priest – Total Acres = 29,078
Scotchman Peaks	662	32,068	25,885	Scotchman Peaks – Total Acres = 25,885
Selkirk	125	97,964	56,400	Selkirk – Total Acres = 56,400
Total			**331,005**	**331,005**

[1] Potential wilderness acres do not match total area acres for individual roadless areas because boundaries of recommended wilderness areas sometimes include acres outside of the roadless boundary and sometimes exclude some of the roadless area.

This evaluation of potential wilderness is not a land designation, nor does it imply any particular level of management direction or protection in association with the evaluation of these potential wilderness areas. It is completed with the express purpose of identifying all lands that meet the criteria for being evaluated for wilderness suitability and possible recommendation to Congress for wilderness study or designation (FSH 1909.12.71).

Recommended Wilderness

As a result of decisions made in the 1987 Forest Plan, 146,682 acres were recommended for wilderness designation (see table 126). These areas have not been designated by Congress as wilderness and portions of all of these areas are being recommended in this revised Forest Plan. This is the existing condition (Alternative A) for recommended wilderness. These areas recommended for wilderness were identified because of special or unique features and public support.

Under the 1987 Forest Plan, the use of motorized and mechanized equipment in recommended wilderness is allowed to varying degrees.

Levels of motorized travel were much lower in the mid-1980s when the existing Forest Plan was completed. The increased popularity and expansion of these uses, the potential of these activities to affect wilderness character, and potential for designation were not fully anticipated. No recommended wilderness is currently closed to bicycles or other non-motorized mechanized transport such as game carts, back country in-line skates or skate boards, or hang gliders.

Table 126. 1987 IPNF Forest Plan Recommended Wilderness

Name	1987 Plan Acres
Mallard Larkins	78,527
Salmo-Priest	17,585
Scotchman Peaks	23,912
Selkirk Crest	26,658
Total	**146,682**

Idaho Roadless Rule

In 2008 the Idaho Roadless Rule (36 CFR 294 Subpart C) was finalized and designated 797,100[1] acres of IPNF IRAs in five themes outlined in the Roadless EIS. These five management themes include: *Wild Land Recreation; Special Areas of Historic or Tribal Significance; Primitive; Backcountry/ Restoration; and General Forest, Rangeland, and Grassland*. Inventoried roadless areas managed by the IPNF but outside Idaho (in Montana or Washington States), and not covered by the Idaho Roadless Rule, total 53,340 acres.

Most of the inventoried roadless areas (41 of 48) on the IPNF are managed under themes established by the 2008 Idaho Roadless Rule. Three more inventoried roadless areas[2] are partially in Idaho and the acreage inside Idaho is managed under an Idaho Roadless theme, as well. The 44 areas wholly or partially in the state of Idaho and on the IPNF are listed in table 127, with the Idaho Roadless Rule theme applicable to the particular inventoried roadless area.

[1] This figure includes only those inventoried roadless acres on the IPNF that are within Idaho State.
[2] The three areas partially in Idaho are Buckhorn Ridge, Little Grass Mtn., and Scotchman Peaks.

Table 127. Idaho Roadless Rule Designated Management Themes for IPNF Inventoried Roadless Areas

Inventoried Roadless Area	#	Total (Acres)[1]	WLR[2] (Acres)	Prim[2] (Acres)	BCR[2] (Acres)	GFRG[2] (Acres)	SAHTS[2] (Acres)	FF
Beetop	130	12,400			12,400			
Big Creek	143	76,300			76,300			
Blacktail Mtn	122	5,000			4,200			
Blacktail Mtn	161	4,800			4,800			
Buckhorn Ridge	661	6,700			6,700			
Continental Mtn	153	7,500			7,500			
E. Cathedral Pk	131	22,300			20,000			
Gilt Edge-Silver Creek	792	200			200			
Graham Coal	139	10,300			10,200			
Grandmother Mountain	148	24,400	6,800		17,100	100		
Hammond Cr	145	17,400			17,400			
Hellroaring	128	2,000				2000		
Katka Peak	157	10,300			9,000	1,300		
Kootenai Peak	126	5,000				5,000		
Little Grass Mtn	121	3,900			3,900			
Lost Creek	137	11,600			11,500			
Magee	132	34,800			34,800			
Mallard Larkins	300	129,400	72,100		45,800			
Maple Peak	141	8,700			8,700			
Meadow Cr-Upper N Fork	302	6,000			4,500			
Midget Peak	151	7,200			6,400			
Mosquito-Fly	150	19,400			17,900			
Mt. Willard-Lake Estelle	173	35,000			33,600			
North Fork	147	31,400			30,500			
Packsaddle	155	19,300			19,300			
Pinchot Butte	149	8,500			8,500			
Roland Point	146	6,500			6,500			
Saddle Mountain	154	7,800			7,800			

Inventoried Roadless Area	#	Total (Acres)[1]	WLR[2] (Acres)	Prim[2] (Acres)	BCR[2] (Acres)	GFRG[2] (Acres)	SAHTS[2] (Acres)	FPSA[2] (
Salmo-Priest	981	20,000	14,300					
Schafer Peak	160	5,900			5,500	400		
Scotchman Peaks	662	19,800	10,900		7,600			
Selkirk	125	98,000	42,000		41,300	8,600		
Sheep Mountain-State Line	799	27,700			26,900			
Skitwish Ridge	135	4,000			4,000			
Spion Kop	136	22,400			19,600			
Stevens Peak	142	4,700			4,700			
Storm Creek	144	8,200			8,200			
Tepee Creek	133	5,200			5,200			
Trestle Peak	129	7,300			7,300			
Trouble Creek	138	6,000			5,000			
Trout Creek	664	8,500			8,400			
Upper Priest	123	12,700			6,500			
White Mountain	127	7,600			7,500	100		
Wonderful Peak	152	4,900			4,900			
Total		**797,000**	**146,100**	**0**	**588,100**	**17,500**	**0**	

[1] Acres from Idaho Roadless Rule FEIS (rounded to nearest 100 acres)

[2] Idaho Roadless Rule Themes:

WLR - Wild Land Recreation
Prim - Primitive (none on the IPNF)
BCR - Backcountry/Restoration
GFRG - General Forest, Rangeland, and Grassland
SAHTS - Special Areas of Historic or Tribal Significance (none on the IPNF)
FPSA - Forest Plan Special Areas

Table 128 displays the three inventoried roadless areas partially in Idaho but entirely on the IPNF and managed by the IPNF. In addition, this table includes the other four inventoried roadless areas managed by the IPNF outside the state of Idaho.

Table 128. Summary of Other Inventoried Roadless Areas on the IPNF

Inventoried Roadless Area	#	Total Acres	IPNF ID Acres	2008 Roadless Theme	IPNF Other State Acres	Other State
Buckhorn Ridge	661	9,558	6,700	BCR	2,858	Montana
Grassy Top	982	13,629	0		13,614	Washington
Hungry Mountain	156	8,640	0		8,613	Washington

Inventoried Roadless Area	#	Total Acres	IPNF ID Acres	2008 Roadless Theme	IPNF Other State Acres	Other State
Little Grass Mountain	121	7,967	3,900	BCR	4,066	Washington
Northwest Peaks	663	5,481	0		5,477	Montana
Scotchman Peaks	662	32,068	19,800	WLR & BCR	12,270	Montana
South Fork Mountain	124	5,294	0		5,291	Washington
Total		**82,637**	**30,400**		**52,189**	

Environmental Consequences

The purpose of the analysis on the roadless resource is to disclose potential effects to roadless and wilderness attributes and determine if, or to what extent, it might affect future consideration for wilderness recommendations. This analysis focuses on the potential effects of land management designations and allowable uses on wilderness characteristics as defined in the Forest Service Handbook (FSH) 1909.12 (72.1). Wilderness characteristics, as defined in FSH 1909.12 (72.1) and evaluated here, include the following:

- Natural – The extent to which long-term ecological processes are intact and operating.
- Undeveloped – The degree to which the impacts documented in natural integrity are apparent to most visitors.
- Outstanding opportunities for solitude or primitive unconfined recreation – Solitude is a personal, subjective value defined as the isolation from sights, sounds, and presence of others, and from developments and evidence of humans. Primitive recreation is characterized by meeting nature on its own terms, without comfort and convenience of facilities.
- Special features and values – Unique ecological, geographical, scenic, and historical features of an area.
- Manageability – The ability to manage an area for wilderness consideration and maintain wilderness attributes.

General Effects

The following discussion includes general effects on roadless areas. Management area allocations will not directly affect the character of roadless areas until a planned management activity is scheduled. Management activities that substantially alter the undeveloped character of an inventoried roadless area would generally require preparation of an EIS (FSH 1909.15 21.2).

The MA allocation MA1b (recommended wilderness) is designed to provide areas where wilderness characteristics are protected. This management area is designed to meet Forest Service Manual and Handbook requirements and contains direction to manage the recreation settings to the standards established for recommended wilderness areas.

The effects for all alternatives are based on assigned MAs and their potential for development. Alternatives are compared based on acres assigned to the various MAs. Table 129 lists the aces by recommended wilderness area for each alternative.

Each alternative displays a mix of land and resource uses that best meet public needs for recommendation of potential wilderness areas in the National Wilderness Preservation System based on the alternative theme. The 1982 planning provisions require alternatives to be distributed between the minimum resource potential and maximum resource potential to reflect, to the extent practicable, the full range of major commodity and environmental resource uses and values that could be produced from the Forest. Alternatives were developed to address the range of lands to recommend for wilderness. Alternative C was developed to provide more recommended wilderness than the preferred alternative. It was developed by identifying areas that could provide large expanses of recommended wilderness; therefore, it recommends the four roadless areas in the Cathedral Peak area as recommended wilderness: the Grassy Top Roadless Area (in Washington) on the Priest Lake Ranger District; and three additional areas adjacent to the Mallard Larkins (Mosquito Fly, Sheep Mountain-State Line, and Meadow Creek-Upper North Fork). These areas are in addition to the recommended areas in Alternative B Modified.

Table 129. Acres of Recommended Wilderness by Alternative

Area	Acres by Alternative			
	A[1]	B Modified	C	D
Cathedral Peak			71,300	
Grassy Top			13,600	
Mallard Larkins	77,200	80,200	134,800	57,100
Salmo Priest	17,300	18,600	29,100	19,500
Scotchman Peaks	23,900	25,900	25,900	24,800
Selkirk	28,600	36,700	56,400	36,700
Total Acres	**147,000**	**161,400**	**331,100**	**138,100**

[1] Updated acres from 1987 Plan using current land status and GIS.

Effects of Forestwide Direction

Alternative A – No-action Alternative

This alternative reflects the 1987 Forest Plan, as amended to date, and accounts for current laws and regulations that have been promulgated since the original Forest Plan and the amendments were adopted. The 1987 ROD identified four recommended wilderness areas: Mallard Larkins, Salmo-Priest, Scotchman Peaks, and the Selkirk area for a total of 146,682 acres.

Alternative B Modified, C, and D

All action alternatives recommend some wilderness, to varying degrees. Alternative B Modified is based on the proposed LMP from May 2006 and the response to comments on the proposed Plan, prior to the 2008 Planning Rule being enjoined and vacated. Alternative B Modified recommends the same four potential wilderness areas as Alternative A but with some variations in boundaries. Total acres of recommended wilderness are 161,400 and when MA1e (primitive lands) is added the total acreage is 181,200.

Alternative C recommends six potential wilderness areas for a total of 331,100 acres. This alternative was developed based on public comments which desired more lands to be considered for recommended wilderness. It was developed by identifying areas that could provide large expanses of recommended wilderness and to provide the range of alternatives as required by the 1982 provisions. Therefore, it recommends the four roadless areas in the Cathedral Peak area as recommended wilderness: the Grassy Top Roadless Area (in Washington) on the Priest Lake Ranger District; and three additional areas adjacent to the Mallard Larkins (Mosquito Fly, Sheep

Mountain-State Line, and Meadow Creek-Upper North Fork). These areas are in addition to the recommended areas in Alternative B Modified.

Alternative D will feature a higher intensity management regime with emphasis on timber production and motorized access. This alternative recommends the same four areas as Alternatives A and B Modified for potential wilderness but with variations in boundaries and slightly different acreages.

Consequences to Roadless Areas from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Management Area Allocations

Research shows Americans who engage in outdoor activities are seeking opportunities for day hikes. Typically, visitors prefer day hiking to a destination such as a waterfall, lake, scenic vista, or unique feature. Forests near population centers in Idaho and Montana should continue to consider this need for non-motorized hiking trails as they complete their wilderness assessments (Regional Wilderness needs assessment (USDA Forest Service 2003c)).

Table 130 shows proposed allocations of inventoried roadless areas by Forest Plan MAs in the various alternatives. All the acres shown were included in the inventoried roadless area review completed for this revision.

Table 130. Allocation of Inventoried Roadless Acres to MAs by Alternative

MA	Alt A[1]	Alt B Modified	Alt C	Alt D
MA1b Wilderness Recommended	144,000	147,485	297,218	127,047
MA1c Wilderness Study Area	0	6,788	6,788	6,788
MA1e Primitive Lands	0	11,049	0	11,048
MA2a Designated W&S Rivers		12,628	12,692	12,693
MA2b Eligible W&S Rivers		12,776	6,875	11,026
MA3 Special Areas	6,800	9,693	9,605	31,795
MA4 Research Natural Areas	8,400	7,582	7,582	7,582
MA5 Backcountry	190,600	624,803	492,081	622,734
MA6 General Forest Area		18,115	18,074	20,203
MA7 Primary Recreation Areas	1,700	82	82	82
Total		**851,000**	**850,997**	**850,999**

[1] Acres shown in Alternative A are best estimates based on 1987 IPNF Forest Plan MA designations and a cross walk developed to compare these 1987 MAs with the action alternative MAs. The remaining acres were assigned to various MAs in the 1987 Plan that does not cross-walk cleanly to the action alternatives MAs.

Management area allocations can be grouped into broad categories: areas that allow a full range of development opportunities (MA6, MA7): areas that have potential for low levels of development and maintain their undeveloped roadless character (MA2a [Wild], MA2b [Wild], MA3, MA4a, and MA5); and areas that are recommended as wilderness (MA1b) and primitive lands (MA1e). Management area allocations will not directly affect the character of IRAs until management activities are planned and implemented. As displayed in table 130, Alternative C has the most acres of IRAs allocated to recommended wilderness (MA1b). Alternatives B Modified and D have the second most acres and Alternative A the least acres in recommended wilderness. Alternatives B Modified and D have the most acres of IRAs allocated to backcountry

(MA5). Alternative C has the second most acres and Alternative A the least in backcountry (MA5).

Appendix C contains information on the allocation of each roadless area by alternative. The effects for all alternatives are based on assigned management area direction and their potential for development. The forestwide and MA direction is the same for all action alternatives.

Effects from Fire and Fuels Management

Forest health, as it affects natural integrity, is an issue of concern with roadless areas and recommended wilderness. Effective fire suppression, insect and disease infestations, and vegetation and fuel types on the IPNF have led to substantial areas with moderate-high to high risk of uncharacteristic wildfire.[1] Natural, unplanned ignitions may be managed to meet resource objectives to trend vegetation towards desired conditions. Likewise, prescribed fire may be used to trend vegetation towards the desired conditions while serving other important ecosystem functions.

Roadless areas allocated to MA5 would use prescribed fire and natural, unplanned ignitions to meet resource objectives as the primary mechanism for managing vegetation (MA5-GDL-Fire-01). The use of fire would be more likely in Alternative C, which emphasizes the use of natural disturbances and has the highest acres of recommended wilderness.

Prescribed fire and the use of natural, unplanned ignitions to meet resource objectives would continue the long-term ecological processes in these areas. There could be a temporary loss of vegetation, reduction in water quality due to sedimentation, air pollution, and a perceived reduction in scenic quality; however, these effects are part of the natural ecological processes. These activities generally would not affect the undeveloped character, except during the actual burning period when crews are burning or monitoring the burns. Users could expect temporary access restrictions during periods of fire use activities. Impacts to opportunities for solitude could be expected where visitors encounter crews working on firing operations.

Prescribed fire and the use of natural, unplanned ignitions to meet resource objectives should not affect primitive recreation, although recreational use of burned-over areas may drop for a period of years until vegetative recovery achieves a more advanced stage. Lethal fire in heavy timber stands would also increase long-term trail maintenance needs from continued downfall of snags across trails.

Effects from Timber Harvest

Roadless areas that are allocated to MA1b (recommended wilderness), MA1c (wilderness study areas), MA1e (primitive) and MA3 (special areas) are not available for timber harvest. Limited timber harvest could occur in MA2a (designated scenic or recreation rivers), MA2b (eligible scenic or recreational river), and MA4 (research natural areas); only if done to maintain or restore the values or meet the objectives of the area.

The Idaho Roadless Rule (36 CFR 294 Subpart C) (2008) direction must be followed for vegetative treatments within roadless areas where Idaho Roadless rules apply (within the state of Idaho), in particular those lands in MA5 that are in Idaho. For lands in MA5 outside of Idaho, timber harvest is limited and may only occur to improve habitat for listed or proposed threatened and endangered species; to maintain or restore ecosystem composition and structure; to reduce

[1] Idaho Statewide Forest Resource Strategy – Draft for Comments – Goals, Strategies, and Implementation – May 4, 2010

the risk of uncharacteristic wildfires; or to address insect and disease or other forest health concerns. Timber harvest may also be allowed for administrative uses as defined in 36 CFR 223.2. Timber harvest is not scheduled and does not contribute toward the ASQ (MA5-STD-TBR-01).

For those lands in MA6, timber harvest could occur for the purposes of timber growth and yield. Other forestwide management direction would apply to these areas and could constrain the extent, timing, and duration of timber harvest in MA6.

Treatment of vegetation by mechanical means can affect natural appearance with creation of linear patterns and presence of stumps.

The existing roadless character may be modified where timber harvest occurs. In MA5, timber harvest is expected to be limited and generally would be done for purposes that would result in retaining the natural integrity of the ecosystem. Timber harvest that is done to reduce hazardous fuels may be more intensive and change the undeveloped character, to some degree, until the vegetation re-grows. This is most likely to happen on the edges of a roadless area nearer communities. Primitive recreation opportunities would be unchanged, unless temporary roads are constructed, which is permitted under specific circumstances in the Idaho Roadless Areas in MA5. Road construction is not permitted in MA5 outside of Idaho.

Under the Idaho Roadless Rule, temporary road construction is permitted in Community Protection Zones, or where there is a significant risk of wildland fire to at-risk communities or municipal water supply systems. About 54,200 acres are estimated to be within a community Protection Zone (Idaho Roadless FEIS, appendix E-25). If roads are constructed it may take longer for an area to return to its natural state than if timber harvest alone were to take place. Timber harvest and temporary roads could change the scenic integrity until the vegetation re-grows. Solitude would be affected during operations.

Timber harvest in MA6 could be more extensive. However, the 18,000-20,000 acres of IRAs in MA6 are on the edges of the roadless areas, and generally adjacent to roads. Activities in these areas would not be in the heart of the roadless areas and would not affect a roadless areas ability to provide primitive recreation or solitude. The only exception is the 2,000 acre Hellroaring roadless area. This roadless area is small in size and currently provides limited primitive recreation opportunities or opportunities for solitude. The undeveloped character of roadless areas could be affected where timber harvest occurs, at least until the vegetation re-grows. If roads are constructed to access any of these areas, they could also affect the primitive nature and undeveloped character. As noted before, road construction would be limited to this MA and would generally occur on the outer edges of a roadless area.

Effects from Terrestrial Wildlife Management

Wildlife management actions may result in a broad array of physical alterations including road obliteration, vegetation treatments, prescribed burning, and habitat improvement structures. Some of these actions could be visually evident and detract somewhat from roadless values and wilderness characteristics if proposed within these MAs. However, actions which maintain, restore, protect, or enhance wildlife habitat also improve natural integrity and ecosystem function and benefit roadless and wilderness values in the long-term.

Watershed and fisheries improvement actions can include construction of structures for stream bank stabilization, slope stabilization, and fish habitat improvements. Some structural improvements may be visually evident, and may detract from apparent naturalness. However, any such structures are generally small and localized and would have a negligible effect upon undeveloped character and wilderness characteristics.

Effects from Minerals Management

The Salmo-Priest Wilderness Area and portion of the St. Joe River that is designated as a Wild River under the Wild and Scenic River Act have been withdrawn from mineral entry and are not available for new leases or claims. Minerals management has no effect on these congressionally designated areas.

Roadless areas may be affected by mineral development. The exploration and development of locatable minerals is allowed within roadless areas and recommended wilderness and does not vary by alternative. Mineral exploration and development activities can vary from small, easily reclaimed operations to larger developments. Large mines may lead to extensive site alterations and long-term impacts to the undeveloped character of roadless areas and possibly negatively affect wilderness characteristics. However, evidence of past mining, and even ongoing mining operations do not necessarily preclude wilderness consideration, although they may make it less likely.

MA1b, 1c, and 1e (within Idaho Roadless Areas) preclude mineral leasing. Therefore, there would be no effect on roadless character in these areas. Mineral leasing in MA5 lands is permitted; however, road construction or reconstruction to access these areas is not. Oil and gas leasing and geothermal opportunities are limited on the IPNF. Without the ability to construct roads in these areas it is anticipated there would be no development. (Also see Idaho Roadless FEIS Minerals and Energy Section).

On the 18,000 to 20,000 acres of MA6, mineral leasing and road construction is permitted. However, as stated above, there are few oil and gas or geothermal opportunities; therefore, few if any anticipated effects.

Effects from Access and Recreation Management

Areas that are recommended for wilderness will be managed to protect the wilderness character of that area. However, recommendation of an area for wilderness designation may lead to increased recreation use. An increase in use may lead to improvement of trailhead facilities or other visitor management techniques.

Opportunities for primitive and semi-primitive recreation will be found in inventoried roadless areas and recommended wilderness areas. Inventoried roadless areas assigned to other MAs will be managed for recreation opportunities appropriate to the assigned MA. The existing settings are generally semi-primitive non-motorized or semi-primitive motorized in character. Table 119 in the “Access and Recreation” section of this document indicates the percentage of acres where various uses (motor vehicle use, over-snow vehicle use, and mechanized use) are allowed across the Forest by alternative. Percentages were determined by calculating the area of MA allocations and current closed areas that would remain in affect regardless of alternative selected. The percentages indicate where these uses are allowed, but the MVUMs indicate the designations for motor vehicle use (36 CFR 212 Subpart B) regardless of alternative selected.

Since the 1970s, interest in and appreciation of the environment has increased national forest recreation visitation and has shifted activities and expectations. As temperatures increase during the summer, and a majority of the Forest is free from snow cover, many people venture out onto the national forests for relief from the heat and to pursue traditional outdoor recreational opportunities.

Technical advancements in snowmobiles now allow visitors to travel many places where they were unable to travel as recently as 5 years ago. The development of the ATV has added a new motorized use in the summer and allows many people to travel on routes into areas that they may never have been able to travel into previously. Lastly, the advent of the mountain bike has added a summer non-motorized use that was not considered when the 1987 Forest Plan was written.

All of these issues, along with several others, have led to more crowded recreation experiences during peak use times, increasing levels and range of demands on natural resources and resource managers, and more conflicts among the users themselves.

Continuing changes in equipment technology used for recreational purposes on the Forest will have impacts on the manner of how and where people recreate. These changes in uses may alter the recreational experience in some areas. Those who pursue recreation opportunities such as hiking or back-country skiing in remote settings are likely to be more affected than other users as they prefer areas that are off limits to motorized uses.

Trails and new trail construction are usually compatible with maintaining wilderness characteristics and undeveloped character.

Cumulative Effects

The cumulative effects analysis for roadless areas and recommended wilderness considers land within the IPNF boundary throughout the life of the revised Forest Plan. It also includes a review of designated wilderness on public lands in Idaho. The KNF is on the same timeline as the IPNF to revise their Forest Plan and the forests in Region 6 to the west in Washington (Colville, Okanogan-Wenatchee) are working on revised Forest Plans as well. The KNF and Colville National Forest are adjacent to the IPNF. The KNF is analyzing a range of recommended wilderness from 37,300 acres to 242,800 acres in the various alternatives being considered. The 1988 Colville National Forest Plan did not recommend additional wilderness. The Salmo-Priest Wilderness totals 29,386 acres on the Colville National Forest. The Scotchman Peaks recommended wilderness area is located on both the KNF and IPNF. Total acreage ranges from 24,800 acres to 63,200 of recommended wilderness acres in the alternatives that both Forests are evaluating.

Wilderness has been officially designated on federal lands other than NFS lands. In the state of Idaho a total of 4,522,562 acres have been designated as wilderness. In Montana the total is 3,443,385 acres and in Washington State the total acres of designated wilderness is 4,423,405[1]. These figures include wilderness managed by all agencies.

Population growth in Idaho and Washington, and development adjacent to NFS lands, result in increasing demands ranging from commodity production to demands for all types of recreation opportunities. Roadless areas have traditionally provided for semi-primitive recreational opportunities. Pioneered roads and trails on public lands reflect the increased demand for motorized and mechanized opportunities, but they result in a decrease in opportunities for primitive and semi-primitive non-motorized recreation and may adversely impact soil, water, and wildlife resources. Private land development adjacent to public lands in the region has influenced the movement pattern of many wide-ranging wildlife species. This development negatively

[1] This includes the 11,949 acres of the Salmo-Priest managed by the IPNF (located in Washington State).

affects the availability and quality of wildlife habitat and increases the importance of similar undeveloped habitats within roadless areas. It is anticipated that development will further fragment unroaded private lands, decreasing the opportunities for primitive recreation experiences and the quality of wildlife habitat. Alternative C would provide the most opportunities to manage roadless areas as recommended wilderness and for primitive recreation opportunities, followed by Alternatives B Modified, A, and D. Alternative D would provide the fewest additional opportunities.

Idaho Roadless Rule

The Idaho Roadless Rule (36 CFR 294 Subpart C) classified lands in Idaho Roadless Areas into five different classifications: Wild Land Recreation, Primitive, Special Areas of Historic or Tribal Significance, Backcountry/Restoration, General Forest, Rangeland, and Grassland. They will be managed according to the Idaho Roadless Rule. It also classified some areas, such as wild and scenic river corridors and RNAs as Forest Plan special areas. These areas would be managed according to the LMP. On the IPNF only Wild Land Recreation, Backcountry/Restoration and General Forest, Rangeland, and Grassland exists in the Idaho Rule. No lands were classified as Primitive or Special Areas of Historic or Tribal Significance.

Table 131 shows which MAs are comparable to the management classifications in the Idaho Roadless Rule regarding timber cutting, sale and removal, road construction, reconstruction, and discretionary minerals. It is important to note that the Idaho Roadless Rule only addressed these uses whereas the management direction in the LMP addresses other uses, such as motorized and non-motorized use.

Table 131. Comparison between Idaho Roadless Area Management Classifications and IPNF Management Areas

Idaho Roadless Rule Theme	Comparable Management Areas
Wild Land Recreation	MA1b Recommended Wilderness MA1c Wilderness Study Areas MA1e Primitive lands MA3 Mallard Larkins Pioneer Area
Backcountry/Restoration	MA5 Backcountry
General Forest, Rangeland, and Grassland	MA6 General Forest
Forest Plan Special Area	MA2a Wild and Scenic Rivers MA2b Eligible Wild and Scenic Rivers MA3 Botanical, Geological, Recreational, or Scenic Areas MA4a Research Natural Areas MA7 Primary Recreation Areas

Alternative A, the no-action alternative, is superseded by the Idaho Roadless Rule, so this rule applies to the no-action alternative. The MA direction (and polygons) in Alternatives B Modified and D are comparable to the Idaho Roadless Rule with some minor exceptions regarding areas that were acquired in land exchanges after the rule was promulgated and some mapping discrepancies (see tables 132 and 133).

Table 132. Comparison between Alternative B Modified and Idaho Roadless Area Management Classifications

IRA Name	Number	Forest Plan MA Acres			Idaho Roadless Theme Acres			
		MA5	MA6	Other	WLR	BCR	GFRG	FPSA
Beetop	130	12,400				12,400		
Big Creek	143	76,500[1]				76,300[1]		
Blacktail Mountain	122	4,100		800		4,100		800
Blacktail Mountain	161	4,800				4,800		
Buckhorn Ridge	661	6,600 (IPNF) 100 (KNF-ID) 2,900 (IPNF–MT)				6,600 (IPNF) 100 (KNF-ID)		
Continental Mountain	153	7,500				7,500		
East Cathedral Peak	131	20,000		2,300		20,000		2,300
East Fork Elk	678		100				100	
Gilt Edge-Silver Creek	792	200				200		
Graham Coal	139	10,200		100		10,200		100
Grandmother Mtn	148	18,200[2]	100	7,200	6,800	17,100[2]	100	400
Grassy Top	982	13,500		100	Outside Idaho (in Washington)			
Hammond Creek	145	17,400				17,400		
Hellroaring	128		2,000				2,000	
Hungry Mountain	156	8,600			Outside Idaho (in Washington)			
Katka Peak	157	9,000	1,300			9,000	1,300	
Kootenai Peak	126		5,000				5,000	
Little Grass Mountain	121	3,900 (IPNF) 4,100 (IPNF-WA)		34 (IPNF-WA)		3,900 (Idaho portion)		
Lost Creek	137	11,500		100		11,500		100
Magee	132	34,800				34,800		
Mallard-Larkins[3]	300	45,700		83,700	72,100	45,800	12	11,500

IRA Name	Number	Forest Plan MA Acres			Idaho Roadless Theme Acres			
		MA5	MA6	Other	WLR	BCR	GFRG	FPSA
Maple Peak	141	8,700				8,700		
Meadow Creek-Upper North Fork	302	4,500		1,500		4,500		1,500
Midget Peak	151	6,500[4]		800		6,400[4]		800
Mosquito Fly	150	17,900		1,500		17,900		1,500
Mt. Willard-Lake Estelle	173	33,600 (IPNF) 23,100 (KNF-ID)		1,400 (IPNF) 200 (KNF-ID)		33,600 (IPNF) 23,100 (KNF-ID)		1,400 (IPNF) 200 (KNF-ID)
North Fork	147	30,500		800[4]		30,500		900[4]
Northwest Peaks	663	700	200	4,600	Outside Idaho (in Montana)			
Packsaddle	155	19,300				19,300		
Pinchot Butte	149	8,600[5]				8,500[5]		
Roland Point	146	6,600[6]				6,500[6]		
Saddle Mountain	154	7,800				7,800		
Salmo-Priest	981			20,000	14,300			5,700
Schafer Peak	160	5,500	400			5,500	400	
Scotchman Peaks	662	7,700 (IPNF) 500 (KNF-ID)	400 (IPNF-MT)	12,200(IPNF) 11,900 (IPNF-MT)	10,900	7,600 (IPNF) 600 (KNF-ID)		1,300
Selkirk	125	41,200[4]	8,600	48,100	42,000	41,300[4]	8,600	6,100
Sheep Mtn.–State Line	799	27,000[7]		800		26,900[7]		800
Skitwish Ridge	135	4,000				4,000		
South Fork Mountain	124	5,300			Outside Idaho (in Washington)			
Spion Kop	136	19,600		2,700[4]		19,600		2,800[4]
Stevens Peak	142	4,700				4,700		
Storm Creek	144	8,200				8,200		
Tepee Creek	133	5,200				5,200		

IRA Name	Number	Forest Plan MA Acres			Idaho Roadless Theme Acres			
		MA5	MA6	Other	WLR	BCR	GFRG	FPSA
Trestle Peak	129	7,300				7,300		
Trouble Creek	138	5,000		1,000		5,000		1,000
Trout Creek	664	8,400		100		8,400		100
Upper Priest	123	6,300[8]		6,300[8]		6,500[8]		6,200[8]
West Fork Elk	692	3,700 (KNF-ID)				3,700 (KNF-ID)		
White Mountain	127	7,500	100			7,500	100	
Wonderful Peak	152	5,000[9]				4,900[9]		

[1] Acreage difference between Alternative B Modified and Idaho Roadless is due to land exchanges included in the proposed Forest Plan that was not included in the Idaho Roadless Rule.

[2] Total acreage differences between Alternative B Modified and Idaho Roadless is due to recent land exchanges totaling 1,151 acres included in the proposed Forest Plan.

[3] Acreage difference between Alternative B Modified and Idaho Roadless Rule is due to GIS differences along the boundary with the Clearwater National Forest and buffering of road corridors on some "Cherry Stemmed" roads.

[4] Acreage difference between Alternative B Modified and Idaho Roadless Rule is due to rounding to nearest 100 acres.

[5] Acreage difference is due to a land exchange where the Forest acquired 80 acres in 2008 and this acreage is included in the Alternative B Modified but not included in the Idaho Roadless Rule.

[6] Acreage difference is due to a land exchange where the Forest acquired 72 acres in 2008 and this acreage is included in the Alternative B Modified but not included in the Idaho Roadless Rule.

[7] Acreage difference between Alternative B Modified and Idaho Roadless Rule is due to acres along the state boundary were not included in the Idaho Roadless Rule but were included in the Alternative B Modified and rounding differences to nearest 100 acres.

[8] Acreage difference between the Idaho Roadless Rule BCR theme and the Alternative B Modified MA5 designation is the overlap of MAs included as Forest Plan Special Areas in the Alternative B Modified and included as BCR in the Idaho Roadless Rule. In addition there is a 36 acre polygon that should be displayed as water (part of Upper Priest Lake) and a 3 acre sliver along a private land boundary that was included in the Idaho Roadless Rule and not included in the Alternative B Modified; rounding to the nearest 100 acres accounts for the remainder of the difference in acreage.

[9] Acreage difference between the Idaho Roadless Rule and Alternative B Modified is due to the different roadless boundaries used for each planning effort. Most of the acreage difference is due to differences in mapping the roadless areas and the boundaries that separate this roadless area (Wonderful Peak) and the two adjacent roadless areas (Stevens Peak & Roland Point). The remaining difference is due to rounding to the nearest 100 acres.

Table 133. Comparison between Alternative D and Idaho Roadless Area Management Classifications[1]

IRA Name	Number	Forest Plan MA Acres			Idaho Roadless Theme Acres			
		MA5	MA6	Other	WLR	BCR	GFRG	FPSA
Buckhorn Ridge	661	6,600 (IPNF) 100 (KNF-ID) 700 (IPNF-MT)	2,200 (IPNF-MT)			6,600 (IPNF) 100 (KNF-ID)		
Northwest Peaks	663	900		4,600	Outside Idaho (In Montana)			
Sheep Mountain –State Line	799	26,900	28	800		26,900		800

[1] Comparisons between Alternative D and the Idaho Roadless Rule are the same as portrayed in table 132 with the exception of these three roadless areas.

The following describes the difference between the Idaho Roadless Rule and Alternative C. The 1982 planning procedures include direction for alternatives to be distributed between the minimum resource potential and maximum resource potential to reflect, to the extent practicable, the full range of major commodity and environmental resource uses and values that could be produced from the Forest. Therefore, alternatives were developed to address the range of lands to recommend for wilderness. Alternative C was developed by identifying areas that could provide large expanses of recommended wilderness; therefore, it recommends the four roadless areas in Cathedral Peak as recommended wilderness; and the Grassy Top Roadless Area (in Washington) on the Priest Lake Ranger District; and three additional areas adjacent to the Mallard Larkins (Mosquito Fly, Sheep Mountain-State Line, and Meadow Creek-Upper North Fork). These areas are in addition to the areas recommended in Alternatives B Modified and D.

The Idaho Roadless Rule and state of Idaho's petition, from which the rule was based, were land classification and management systems that are distinct from wilderness and did not examine wilderness potential.

Alternative C was developed to address lands to recommend for wilderness. Alternative C would deviate from the Idaho Roadless Rule in the following roadless areas:

- **East Cathedral (22,300 acres):** The Idaho Roadless Rule designated 20,000 acres as backcountry/restoration and 2,300 acres as Forest Plan special areas. Alternative C would designate the entire area as MA1b recommended wilderness, which would be a more restrictive prescription than the Idaho Roadless Rule.
- **Magee (34,800 acres):** The Idaho Roadless Rule designated the entire 34,800 acres as backcountry/restoration. Alternative C would designate the entire area as MA1b recommended wilderness, which would be a more restrictive prescription than the Idaho Roadless Rule.
- **Mallard Larkins (129,400 acres):** The Idaho Roadless Rule designated 72,100 acres as wild land recreation; 45,800 acres as backcountry/recreation, and 11,500 acres as Forest Plan special areas. Alternative C would designate 75,500 acres as MA1b, 43,300 acres as MA5, and 10,600 acres as MA2a, 2b, or 4a. About 2,500 acres would be given a more restrictive prescription than the Idaho Roadless Rule.
- **Meadow Creek-Upper North Fork (6,000 acre):** The Idaho Roadless Rule designated 4,500 acres as backcountry/recreation, and 1,500 acres as Forest Plan special areas. Alternative C would designate 4,400 as MA1b recommended wilderness, which would be a

more restrictive prescription than the Idaho Roadless Rule. About 1,500 acres would be in MA2a and 100 acres in MA5 which would be comparable to the Idaho Roadless Rule.

- **Mosquito Fly (19,400 acres):** The Idaho Roadless Rule designated 17,900 acres as backcountry/restoration and 1,500 acres as Forest Plan special areas. Alternative C would designate the 17,900 acres as MA1b recommended wilderness, which would be a more restrictive prescription than the Idaho Roadless Rule. The remaining 1,500 acres would be in MA2a which is consistent with the Rule.
- **Sheep Mountain State Line (27,700 acres):** The Idaho Roadless Rule designated 26,900 acres as backcountry/restoration and 800 acres as Forest Plan special areas. Alternative C would designate the 26,600 acres as MA1b recommended wilderness, which would be a more restrictive prescription than the Idaho Roadless Rule. About 800 acres would be in MA2a and 300 acres in MA5 which would be comparable to the Idaho Roadless Rule.
- **Spion Kop (22,400 acres):** The Idaho Roadless Rule designated 19,600 acres as backcountry/restoration and 2,800 acres as Forest Plan special areas. Alternative C would designate the 8,900 acres as MA1b recommended wilderness, which would be a more restrictive prescription than the Idaho Roadless Rule. About 1,500 acres would be in MA2b, 300 acres in MA4a and 11,700 acres in MA5 which would be comparable to the Idaho Roadless Rule.
- **Teepee Creek (5,200 acres):** The Idaho Roadless Rule designated 5,200 acres as backcountry/restoration. Alternative C would designate the entire 5,200 acres as MA1b recommended wilderness, which would be a more restrictive prescription than the Idaho Roadless Rule.

Designated Wilderness, Wilderness Study Area, Recommended Wilderness

Introduction

The Wilderness Act of 1964 emphasizes the protection of pristine areas and recognizes multiple values and public benefits found in these areas. Wilderness provides outstanding opportunities for solitude and for primitive and unconfined recreational experiences. Wilderness is also important for maintenance of species diversity, protection of threatened and endangered species, protection of watershed, scientific research, and various social values. Wilderness is part of the national forest multiple use management mission.

The IPNF shares management of the Salmo-Priest Wilderness Area with the Colville National Forest. The United States Congress designated this area in 1984, consisting of approximately 41,335 total acres, 11,949[1] of which are on the IPNF. Acres calculated by current GIS analysis and displayed throughout this EIS totals 9,900 acres. All of this wilderness is located in Washington, but is shared between the Colville National Forest and the IPNF. The Salmo-Priest Wilderness is not classified under the Idaho Roadless Rule.

The IPNF manages one administratively designated wilderness study area (WSA) – Grandmother Mountain WSA. It totals 6,900 acres and is located on the St. Joe Ranger District. It was acquired from the BLM as part of two separate land exchanges. The initial 5,200 acres was acquired as part of the Arkansas-Idaho Land Exchange Act of 1992 (Public Law 102-584). The second parcel totaled 1,700 acres and was acquired as part of the Idaho Land Enhancement Act of 2006 (Public Law 109-372). At the time these laws were enacted and the lands exchanged, the BLM was managing both parcels as part of the Grandmother Mountain WSA established under the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1782). Both the Arkansas-Idaho Land Exchange Act (1992) and the Idaho Land Enhancement Act (2006) require that this area be administered to maintain the existing wilderness character and potential for inclusion in the National Wilderness Preservation System. Existing uses that were in place prior to acquisition by the Forest Service continue to occur in the WSA. The Idaho Roadless Rule has classified this WSA as Wild Land Recreation. The Idaho Roadless Rule has additional requirements described in 36 CFR 294 Subpart C.

This section only addresses areas that have already been designated as wilderness or WSAs and recommended for wilderness. Potential additions to the National Wilderness Preservation system are presented here but the analysis of which areas were recommended for wilderness is explained within the "Roadless Area" section in this chapter.

Legal and Administrative Framework

Law and Executive Orders

- **Wilderness Act of September 3, 1964 (16 U.S.C. 1131-1136):** This act provides the statutory definition of wilderness and management requirements for these congressionally designated areas. This act established a National Wilderness Preservation System to be administered in such a manner as to leave these areas unimpaired for future use and enjoyment as wilderness.

[1] USDA Forest Service FS-383, January 2011

- **Federal Land Policy and Management Act of October 21, 1976 (43 U.S.C. 1761-1771):** Section 1782 of this act addresses BLM Wilderness Study Areas. The Grandmother Mountain WSA was acquired from the BLM with this designation.
- **Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C 3210):** This act directs the Secretary of Agriculture to provide adequate access to non-federal land within the boundaries of the NFS including congressionally designated areas.
- **Arkansas-Idaho Land Exchange Act of 1992 (P.L. 102-584):** This act legislated that 5,200 acres of the Grandmother Mountain WSA be transferred from management by the BLM to the Forest Service.
- **Idaho Land Enhancement Act of 2006 (P.L. 109-372):** This act legislated that 1,700 acres of the Grandmother Mountain WSA be transferred from management by the BLM to the Forest Service.

Code of Federal Regulations (CFR)

- **36 CFR 293:** Wilderness–Primitive Areas

Key Indicator

- Acres of recommended wilderness.

Changes between Draft and Final

Acres of recommended wilderness were increased under Alternative B Modified in response to public comment. See the “Inventoried Roadless Area” section for a detailed description of this change. A table summarizing “Acres of Recommended Wilderness by Alternative” was deleted from this section, and the reader is referred to an identical table in the “Inventoried Roadless Areas” section of this document.

Affected Environment (Existing Condition)

Salmo-Priest Wilderness Area

Tucked among the Selkirk Mountains in the extreme northeastern corner of Washington, the U shaped Salmo-Priest Wilderness extends its borders along those of Idaho and British Columbia. Its most prominent features are two very long ridges, generally running southwest to northeast, connected near their northern ends by a ridge crowned by 6,828-foot Salmo Mountain. The eastern ridge stands lower, more wooded, more rounded off, and more accessible than the steep-sided, rocky-crested western ridge. Streams have cut deep drainages into both ridges. The water from the eastern side of the eastern ridge ends up in Idaho's Priest River. The remaining wilderness drains generally westerly via Sullivan Creek and the Salmo River into the Pend Oreille River.

Below the ridge tops of this well-watered wilderness (at 50 plus inches of precipitation annually) you'll find the largest growth of virgin forest left in eastern Washington: western redcedar, western hemlock, Douglas fir, grand fir, and larch. The Forest is home to mule deer and white-tailed deer, elk, black bears, cougars, bobcats, badgers, pine martens, lynx, bighorn sheep, and moose. Though rarely sighted, threatened and endangered species, (including woodland caribou, grizzly bears, and gray wolves) also roam throughout this area. Winter snows may blanket the ground until early July at higher elevations.

The Shedroof Divide Trail, the longest path in the area at 21.8 miles, follows the extent of the eastern ridge through open timber and subalpine meadows. It traverses several miles of non-wilderness ridgeline into Idaho.

The Salmo-Priest Wilderness is designated as a Class II Wilderness air-shed under the Clean Air Act amendments of 1977.

Grandmother Mountain Wilderness Study Area

The Grandmother Mountain WSA is located in Shoshone County, 45 miles northeast of Moscow, Idaho. Acres administered by the BLM totals 12,140 and are essentially the eastern portion of the area. The Forest Service administers the western 6,900 acres.

The WSA lies within the Grandmother Mountain Roadless Area. The area is part of the St. Joe Ranger District of the IPNF. Several well maintained roads surround the area allowing access at several points. The most popular entry points begin from Fishbook-Gold Center Road 301, Marble Creek Road 321, and the Little North Fork Road 760.

The amoeba-shaped roadless area includes a U-shaped ridge as its center consisting of Grandfather Mountain, Grandmother Mountain, Marks Butte, Crater Peak, Widow Mountain, and Lookout Mountain. Several cirques, cirque lakes, and moraines along the ridge line remain as evidence of past glacial activity, especially in the area of Lookout Mountain. The headwaters of Marble Creek, a major tributary of the St. Joe River, flow northward from the ridgeline. Flowing to the east are the headwaters of the Little North Fork of the Clearwater Rivers. The southwest corner is drained by Placer Creek into the St. Maries River system. Elevations range from 6,800 feet at Widow Mountain to 3,400 feet at Marble Creek. Vegetation patterns reflect the high elevation, glacial activity, and past fire history of the area. Nearly half of the roadless area consists of immature pole or sawtimber stands of mixed composition resulting from wildfires in 1910 and 1923. The remaining forested areas consist of mature or over mature stands; largely composed of mountain hemlock, Engelmann spruce, and subalpine fir. Much of the high elevation areas support relatively sparse subalpine vegetation and contain numerous rock or talus slopes. Habitat-types graduate from cedar/clintonia to either a mountain hemlock or subalpine fir series as elevation rises.

The Grandmother Mountain roadless area, including the WSA, provides a variety of recreational pursuits. The current major uses of this area include big game hunting, backpacking, hiking, horseback riding, and fishing. The Freezeout area and the lakes contained in the eastern portion of the roadless area are popular recreational destinations. Snowmobiling, cross-country skiing, and off-road vehicle motorized use continue to increase in popularity, especially on roads contiguous to the roadless area.

Language in both Land Exchange Acts (the Act of 1992, [P.L. 102-584] and the Act of 2006, [P.L. 109-372] required that the area be managed to maintain their presently existing wilderness character and potential for inclusion in the National Wilderness Preservation system.

Environmental Consequences

Resource Protection Methods

Designated wilderness is governed largely by the terms of the Wilderness Act and limit human uses and activities. These limitations are designed to retain the wilderness in a natural and wild state. Project proposals within the Salmo-Priest Wilderness Area are evaluated for compliance with wilderness values. Commercial use of wilderness is limited and controlled by special use permits and their associated operating plans.

General Effects

Because direction for wilderness management is detailed in law, regulation, and agency policy and in specific management plans, management in the various Forest Plan alternatives does not differ. In all alternatives, the existing Salmo-Priest Wilderness Area and Grandmother Mountain WSA acres remain the same. Significant effects to wilderness areas are not expected under any alternative nor are effects expected to differ by alternative. In all action alternatives the Salmo-Priest Wilderness Area is managed under direction that does not vary by alternative. In all action alternatives the Grandmother Mountain WSA would be managed to protect wilderness character, as it existed when the Forest Service acquired the lands in 1992 and 2006.

All action alternatives and the no-action alternative (Alternative A) propose to manage the area directly adjacent to the Salmo-Priest Wilderness Area as recommended wilderness (MA1b). Alternative C contains the most recommended wilderness adjacent to the Salmo-Priest Wilderness Area with about the same amount of recommended wilderness in all three other alternatives.

The following discussion of general effects on wilderness addresses recommendations for additional wilderness primarily in roadless areas. See the “Roadless Area” section in this chapter for a discussion of the affected environment. New areas recommended for wilderness designation have the potential effect of protecting wilderness resources. In general, alternatives that have areas recommended for wilderness exclude motorized and mechanized uses.

Recommended wilderness can affect existing Wilderness and WSA areas. All alternatives recommend additional areas for wilderness designation. Designation of new wilderness may change patterns of recreation use and reduce pressure within existing wilderness areas. Motorized and mechanized travel on trails and winter motorized use would be prohibited in areas recommended for wilderness designation. Motorcycle, snowmobile, bicycle, and ATV use would be displaced in recommended wilderness areas. Recommended wilderness provides larger areas with wilderness character.

The MA allocation for recommended wilderness (MA1b) does not create a wilderness. Congress must pass legislation designating wilderness. MA1b, recommended wilderness, protects the values that make the area suitable for wilderness designation. Management strategies for recommended wilderness may affect recreation opportunities and experiences within these areas.

Effects of Forestwide Direction

Alternative A – No-action Alternative

The no-action alternative (A) and Alternatives B Modified and D include four areas identified as recommended wilderness (MA1b). The four areas include the Salmo-Priest, Selkirk, Scotchman Peaks, and the Mallard Larkins areas. All three alternatives recommend these four areas but differ in recommended acreage. Alternative C includes these four areas plus the Cathedral Peak area, the Grassy Top area, and a much larger area adjacent to the Mallard Larkins including the western portion of the Mallard Larkins. The western portion of the Mallard Larkins is included in Alternative A as well. Table 129 in the “Inventoried Roadless Areas” section of this document displays the acres of recommended wilderness by alternative.

Alternative B Modified – Proposed Action

Alternative B Modified is based on the Proposed Land Management Plan from May 2006 and the response to comments on the proposed Plan, prior to the 2008 Planning Rule being enjoined and vacated, as well as on comments on the 2011 DEIS for this Forest Plan.

Alternative C

Alternative C recommends the largest acreage as proposed wilderness, emphasizing the use of natural disturbance processes, use of natural, unplanned ignitions to meet resource objectives, and prescribed fires in addition to low-frequency management activities in order to meet watershed and vegetation restoration objectives. The 1982 planning procedures require alternatives to be distributed between the minimum resource potential and maximum resource potential to reflect, to the extent practicable, the full range of major commodity and environmental resource uses and values that could be produced from the Forest. Therefore, alternatives were developed to address the range of lands to recommend for wilderness.

Alternative D

Alternative D features high-intensity management with emphasis on timber production and motorized access. Alternative D has the least amount of recommended wilderness, leaving options for vegetation management and motorized or mechanized access across more areas.

Consequences to Wilderness from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Management Area Allocations

When considering the number of acres where motor vehicle use would be allowed, it must be remembered that this refers only to those acres in MAs where roads or trails may exist and be designated for such use. All four alternatives recommend wilderness and this MA designation would preclude the designation of trails for motor vehicle use. Table 129 displays the recommended wilderness acres by alternative where motorized vehicle use would not be allowed. In addition to recommended wilderness, the primitive lands MA (MA1e) in Alternative B Modified would prohibit designation of motor vehicle use, with the exception of over-snow vehicle use. The addition of MA1e in Alternative B Modified would increase the acreage where motor vehicle use (excluding over-snow vehicle use) is prohibited to 181,200 acres. Motor vehicle use is prohibited in the Salmo-Priest Wilderness Area in all four alternatives. Single track motor vehicle use is allowed within the Grandmother Mountain WSA in all four alternatives as outlined in the two legislative land exchanges. Allowed uses within the wilderness area and the WSA do not vary by alternative.

There is an effect to the number of acres available for over-snow vehicle use based on the amount of recommended wilderness (MA1b) in the various alternatives. Table 129 indicates the acreage of recommended wilderness in each alternative. Alternative C would prohibit over-snow vehicle use on the most acreage while Alternative D would limit this use on the least number of acres. Alternative B Modified includes MA1e which would allow over-snow vehicle use. There would be no prohibition to this use in MA1e. Any area that currently has no prohibition to over-snow vehicle use, and is allocated to MA1b (recommended wilderness), will have a legal order prohibiting this use (as per 36 CFR 212.81, and 36 CFR 261.14) issued in conjunction with the ROD for the revised Forest Plan. Over-snow vehicle use is prohibited in the Salmo-Priest Wilderness Area in all four alternatives. Over-snow vehicle use is allowed within the

Grandmother Mountain WSA in all four alternatives as outlined in the two legislative land exchanges. Allowed uses within the wilderness area and the WSA do not vary by alternative.

There is an effect to the number of acres available for mechanized use (e.g., mountain bikes) based on the amount of recommended wilderness (MA1b) in the various alternatives. Alternative C would prohibit mechanized use on the most acreage while Alternative D would limit this use on the least number of acres. Alternative B Modified includes MA1e which would allow mechanized use. Any area that currently has no prohibition to mechanized use, and is allocated to MA1b (recommended wilderness), will have a legal order prohibiting mechanized use (as per 36 CFR 261.55[b]) issued in conjunction with the ROD for the revised Forest Plan. Mechanized use is prohibited in the Salmo-Priest Wilderness Area in all four alternatives. Mechanized use is allowed within the Grandmother Mountain WSA in all four alternatives as outlined in the two legislative land exchanges. Allowed uses within the wilderness area and the WSA do not vary by alternative.

Alternative C proposes the most recommended wilderness while Alternative D recommends the least. Alternative A proposes more recommended wilderness than Alternative B Modified when analyzing just the recommended wilderness (MA1b), but if the primitive lands (MA1e) are added the total acreage equals 160,700 in Alternative B Modified.

Effects from Fire and Fuels Management

Naturally-ignited fires significantly affect the composition, structure, and functioning of many different types of ecosystems. Fire occurs relatively quickly, but the effects may last over long time spans and influence spatial patterns of vegetation and the distribution of wildlife over an entire region. Because naturally-ignited fire is a key process, fire suppression causes wholesale ecological changes. The importance of fire and impacts of fire suppression have long been understood; and naturally-ignited fire is recognized as a crucial factor in maintaining naturalness within wilderness (Cole and Landres 1995).

Restoring natural processes that occur over large areas, and hundreds of years, will be a formidable management challenge. Restoring natural fire regimes will be difficult because of the risk to property and visitors, both within wilderness and on adjacent lands. Fire, in its natural role, can have a positive effect on the character of wilderness. Wildland fire would continue as a reintroduced process in the Salmo-Priest Wilderness under all alternatives, and would have similar effects.

There is an effect to the number of acres with the most benefits to undeveloped character as use of natural, unplanned ignitions to meet resource objectives would be more likely in Alternative C; which emphasizes the use of natural disturbances and has the highest acres of recommended wilderness. Impacts to opportunities for solitude could be expected where visitors encounter crews managing these fires.

Effects from Vegetation Management

Vegetation management in wilderness, WSAs, and recommended wilderness is restricted to use of natural, unplanned ignitions to meet resource objectives in all alternatives. Wildland fire would continue as a possible management technique under all alternatives. Fire control measures would be used if and where fuels and weather increase risk of unwanted fire in or coming out of wilderness, WSA’s, or recommended wilderness. All alternatives provide for use of natural, unplanned ignitions to meet resource objectives in these areas.

Effects from Terrestrial Wildlife Management

No wildlife management activities are proposed in any of the four alternatives; therefore, would not result in any change in lands recommended for wilderness or allocated to the Grandmother Mountain WSA or within the Salmo-Priest Wilderness Area.

Effects from Access and Recreation Management

Wilderness itself is equally treated under all four alternatives. The Salmo-Priest Wilderness and Grandmother Mountain WSA may be affected by management of adjacent lands, particularly with non-motorized allocations including recommended wilderness in all alternatives. These alternatives would add to the size of protected areas and discourage illegal motorized use that may be entering designated wilderness. Alternative C recommends more wilderness than the other three alternatives so it maintains more acres of wilderness character. Alternative D recommends the least wilderness so it maintains the least amount of acres of wilderness character. The other two alternatives fall between C and D in this regard.

Recreation and travel management restrictions within the Grandmother Mountain WSA do not change by alternative. These are established by the two legislative land exchanges that transferred this area to Forest Service management.

Areas recommended for wilderness will be managed to protect wilderness characteristics. However, recommendation for wilderness designation may lead to increased recreation use within an area. An increase in use may lead to management strategies implemented to protect wilderness values. This Plan does not propose any management activities at this time; therefore, none of the four alternatives would result in any change in the lands recommended for wilderness or allocated to the Grandmother Mountain WSA or Salmo Priest Wilderness Area.

Effects from Minerals Management

There are no mineral management activities proposed in any of the four alternatives; therefore, this would not result in any change in the lands recommended for wilderness or allocated to the Grandmother Mountain WSA. The Salmo-Priest Wilderness Area is legally withdrawn from mineral entry by statute.

Cumulative Effects

Cumulative effects are past, present, and reasonably foreseeable future activities that were considered with regard to the wilderness resource. Cumulative effects have been considered for the life of the Plan. The area of consideration is the IPNF.

Reasonable and foreseeable actions on NFS lands include: future vegetation management, mining/reclamation, population growth, County Comprehensive Plans, expansion of ski areas, and Fire Plan – priority WUI areas.

Population growth and development increases the need for public open space. Growth in the Coeur d’Alene and Spokane areas as well as surrounding areas in Idaho, Montana, and Washington, are likely to increase recreation use of the Forest, including increased wilderness use. The effects of urbanization and population growth on wilderness use and resource conditions are likely to be gradual and extend well beyond the planning period.

The four Forest Plan alternatives do not change the amount of existing wilderness designated on the Forest, in Idaho (or Washington), or in the National Wilderness Preservation System.

Idaho Roadless Rule

Direction contained in the proposed Plan (all action alternatives) for wilderness (MA1a) and Wilderness Study Areas (MA1c) are consistent with the Idaho Roadless Rule (36 CFR 294 Subpart C).

Alternative C examines the wilderness potential of lands beyond those identified in the Idaho Roadless Rule Wild Land Recreation management classification theme. Alternative C is more restrictive than the Idaho Roadless Rule in some areas (see discussion in “Roadless” section).

Wild and Scenic Rivers

Introduction

Congress enacted the Wild and Scenic Rivers Act in 1968 to preserve select river's free-flowing condition, water quality, and outstandingly remarkable values. The most important provision of the Wild and Scenic Rivers Act is protecting rivers from the harmful effects of water resources projects. To protect free-flowing character the Federal Energy Regulatory Commission (which licenses non-federal hydropower projects) is not allowed to license construction of dams, water conduits, reservoirs, powerhouses, transmission lines, or other project works on or directly affecting wild and scenic rivers. Other federal agencies may not assist by loan, grant, and license or otherwise any water resources project that would have a direct and adverse effect on the values for which a river was designated.

The Wild and Scenic Rivers Act also directs that each river in the National Wild and Scenic Rivers System (National System) be administered in a manner to protect and enhance a river's outstanding natural and cultural values. It allows existing uses of a river to continue and future uses to be considered, so long as existing or proposed use does not conflict with protecting river values. The Wild and Scenic Rivers Act also directs building partnerships among landowners, river users, tribal nations, and all levels of government.

Rivers may be identified for suitability studies by an act of Congress under Section 5(a), or through federal agency-initiated study under Section 5(d) (1). By the end of 2002, Congress had authorized 138 rivers for study. Section 5(d) (1) directs federal agencies to consider the potential of wild and scenic rivers in their planning processes; and its application has resulted in numerous individual river designations and state and area-specific legislation.

Both Sections 5(a) and 5(d) (1) require determinations to be made regarding a river's eligibility, classification, and suitability. Eligibility and classification represent an inventory of existing conditions. Eligibility is an evaluation of whether a river is free-flowing and possesses one or more outstandingly remarkable value. If found eligible, a river is analyzed as to its current level of development and a preliminary classification determination is made as to whether it should be placed into one of three classes; wild, scenic, or recreational.

The final procedural step, a suitability study, provides the basis for determining whether to recommend a river as part of the National System. A suitability study is designed to answer the following questions:

- Should the river's free-flowing character, water quality, and outstandingly remarkable values be protected; or are one or more other uses important enough to warrant doing otherwise?
- Will the river's free-flowing character, water quality, and outstandingly remarkable values be protected through designation? Is it the best method for protecting the river corridor? In answering these questions, the benefits and impacts of Wild and Scenic rivers designation must be evaluated and alternative protection methods considered.
- Is there a demonstrated commitment to protect the river by any non-federal entities that may be partially responsible for implementing protective management?

Rivers authorized for suitability studies by Congress are protected under the Wild and Scenic Rivers Act; specifically, Sections 7(b) – prevents the harmful effects of water resources projects; 8(b) – withdraws public lands from disposition under public land laws; 9(b) – withdraws locatable minerals from appropriation under mining laws; and 12(a) − directs actions of other federal agencies to protect river values. These protections last through the suitability study process, including a three-year period following transmittal of the final suitability study report by the President to Congress. The integrity of the identified classification must also be maintained during the protection period.

The identification of a river as eligible through the forest planning process does not trigger any protections under the Wild and Scenic Rivers Act. To manage the river for its potential inclusion into the National System, other authorities are cited to protect its free-flowing character, water quality, outstandingly remarkable values, and preliminary or recommended classification.

No suitability studies are being conducted with this Forest Plan revision.

In this evaluation, only eligibility of rivers on the IPNF is completed. Suitability is deferred, pending:

- Public interest or support in wild and scenic river study;
- Congress expresses interest in a specific river for wild and scenic river designation; or
- A proposed project would alter the free-flowing character of a stream, such as by impoundment, or adversely affect outstandingly remarkable values, or the river's inventoried classification.

Legal and Administrative Framework

Law and Executive Orders

- **Organic Administration Act of June 4, 1897 (30 Stat. 11, as amended; 16 U.S.C. § 473 et seq.):** This act provides the Secretary of Agriculture the authority to regulate the occupancy and use of NFS lands.
- **Multiple-Use Sustained-Yield Act of June 12, 1960 (P.L. 86-517, 74 Stat.215):** This act provides direction to the NFS lands to provide access and recreation opportunities. The act states, “The policy of Congress is that national forests are established and administered for outdoor recreation…”
- **Wild and Scenic Rivers Act of October 2, 1968 (P.L. 90-542, Stat. 906, as amended; 16 U.S.C. § 1271(note), 1271-1287):** This act established a policy for preserving selected rivers or sections thereof in a free-flowing condition. The intent was to protect water quality of such rivers and to fulfill other vital national conservation measures that would balance the development of water, power, and other resources for the benefit and enjoyment of present and future generations.
- **Federal Land Policy and Management Act of October 21, 1976 (P.L. 94-579, 90 Stat. 2742, as amended):** This act declares (per Sec. 102) that “…the public lands be managed in a manner that…will provide for outdoor recreation and human occupancy and use.”
- **National Forest Management Act (NFMA) of October 22, 1976 (P.L. 94-588, 90 Stat. 2949; 16 U.S.C. § 1600 et seq.):** The act requires the Forest Service to establish a comprehensive system of land and resource planning, including the development and maintenance of a comprehensive and detailed inventory of lands and resources. The act also specifies the use of a systematic interdisciplinary approach to achieve integrated consideration of the physical sciences into planning for the management and use of NFS lands and resources.

Code of Federal Regulations (CFR)

- **36 CFR 297 –** Wild and Scenic Rivers

Key Indicator

- Miles of eligible or suitable wild and scenic rivers.

Analysis Area

The analysis area for wild, scenic, and recreational rivers is the named rivers and streams on the IPNF.

Methodology and Analysis Process

Inventory

The wild and scenic river study process requires determination to be made regarding a river's eligibility, classification, and suitability. Eligibility and classification represent an inventory of existing conditions. Eligibility is an evaluation of whether a river is free-flowing (without major dams, diversions, or channel modifications) and possesses one or more outstandingly remarkable values. These values should be a unique or exceptional representation for the area studied and must be related to the river or its immediate environment.

As per the Wild and Scenic River Act at 5(d) (1) and Forest Service Manual policy (FSM 1924.03) a systematic inventory of named streams and rivers was completed for the IPNF. The inventory of the named rivers and streams on the IPNF was accomplished by using the current GIS databases for rivers and streams on the Forest.

The Forest then determined which of the named rivers and streams were free-flowing. This determination was made by answering the question; "Is the river segment flowing in a natural condition without impoundment, diversion, straightening, rip rapping, or other modification of the waterway"? If the river segment was not free-flowing, then the river was not eligible.

The next step was to identify potential eligibility by determining which of the named rivers and streams that are free-flowing might have a potential 'outstandingly remarkable value'.

Eligibility

To be eligible for designation, a river must be free-flowing and possess one or more outstandingly remarkable value. Thus, the eligibility analysis consisted of an examination of the river's hydrology, including any man made alterations, and an assessment of its natural, cultural, and recreational resources.

In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. Dictionary definitions of the words "unique" and "rare" indicate that such a value would be one that is a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary. Only one such value is needed for eligibility.

The area, region, or scale of comparison is not fixed, and is defined as that which serves as a basis for meaningful comparative analysis; it may vary depending on the value being considered. Typically, a "region" is defined on the scale of an administrative unit, a portion of a state, or an appropriately scaled physiographic or hydrologic unit. The comparative scale used for this assessment is the individual forest. That is, the rivers and streams on the IPNF were compared one to another.

While the spectrum of resources that may be considered is broad, all values should be directly river-related. That is, they should:

- Be located in the river or on its immediate shore-lands (generally within 1/4 mile on either side of the river);
- Contribute substantially to the functioning of the river ecosystem; and/or
- Owe their location or existence to the presence of the river.

Using the Forest as the comparative scale, the IPNF then reviewed the identified potential ‘outstandingly remarkable values’ and determined whether they meet the criteria of being rare, unique, or exemplary. After reviewing the initial assessments a determination was made as to whether the potential outstandingly remarkable value(s) is a unique, rare, or exemplary feature that is significant at the selected comparative scale and meets the other criteria for being directly river-related (as described above) to be considered eligible for wild and scenic river study.

Narratives were developed for each river found to be potentially eligible, clarifying the outstandingly remarkable values that were unique, rare, and exemplary.

Classification

The potential classification of a river found to be eligible is based on the condition of the river and the adjacent lands as they currently exist. Section 2(b) of the Wild and Scenic Rivers Act (1968) specifies and defines these terms as follows:

- **Wild Rivers:** Rivers or sections of rivers free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- **Scenic Rivers:** Rivers or sections of rivers free of impoundments, with shorelines or watersheds still largely undeveloped, but accessible in places by roads.
- **Recreational Rivers:** Rivers or sections of rivers readily accessible by roads or railroad, which may have some development along their shoreline and which may have undergone some impoundments or diversions in the past.

For more information on how the inventory was conducted, the values considered, and classification, see appendix E of the FEIS.

Changes between Draft and Final

Updates have been made to the outstandingly remarkable values in tables 135 and 136 and acres and miles adjusted to match the latest GIS data. Narratives were developed for each eligible river system based on the inventoried outstandingly remarkable values. Only those values that were identified as rare, unique, and exemplary in the narrative have been brought forward as the “outstandingly remarkable values” listed in these tables. These narratives are included in appendix E.

Affected Environment (Existing Condition)

Designated Rivers

Congress designated the St**.** Joe wild and scenic river on November 10th, 1978 (P.L. 95-625 Section 708) as part of the Wild and Scenic Rivers System under the authority granted by the Wild and Scenic Rivers Act of 1968, as amended. The St. Joe River is designated as a classified wild river from Spruce Tree campground upriver to St. Joe Lake near the Montana State line. It is designated as a classified recreational river from Spruce Tree campground downstream to Avery. The St. Joe River totals 8,229 acres for the wild portion and 13,061 for the recreational portion of the river (based on GIS acreage). Proclaimed (land status) acres equal 8,198 designated wild river and 12,665 designated recreational river[1] Table 134 displays information on the designated St**.** Joe Wild and Scenic River.

Table 134. Summary of Designated Wild and Scenic Rivers on the IPNF

River	Status	Length on all Lands (miles)	Length on NFS Lands (miles)	Classification	Acres(on NFS Lands)
St. Joe	Designated	29.0	29.0	Wild	8,229
St. Joe	Designated	41.6	41.6	Recreational	13,061
Total*		**70.6***	**70.6**		**21,290***

* Lengths and acres are a result of using current GIS methodologies.

Suitable Rivers

Suitable Rivers – Section 5(a) of the Wild & Scenic Rivers Act (1968) listed three rivers on the IPNF that were to be studied for their suitability for inclusion into the National Wild and Scenic Rivers System. They were the St. Joe River (the entire main stem), the Moyie River (the segment from the Canadian border to its confluence with the Kootenai River), and the Priest River (the entire main stem).

The suitability studies were completed for these three rivers. The results of these suitability studies found:

- **St. Joe River:** The upper 71.1 miles was determined as suitable for inclusion in the National Wild and Scenic River System. In November 1978, Congress included the upper St. Joe River as part of the National Wild and Scenic River System. This action designated the St. Joe River from the North Fork of the St. Joe River to Spruce Tree Campground as a Recreational River (41.6 miles), and from Spruce Tree Campground to St. Joe Lake as a Wild River (29.5 miles). A Development and Management Plan was completed and included as appendix Z in the 1987 Forest Plan for the IPNF.
- **Moyie River:** This 26.1 mile section of river was determined as unsuitable for inclusion in the National Wild and Scenic Rivers System. A report was transmitted to Congress on September 13, 1982.
- **Priest River:** 20.1 miles of the Upper Priest River (from the Canadian border to Upper Priest Lake) was determined to be suitable for inclusion in the National Wild and Scenic Rivers System and classified as a Wild River. The remaining sections of the Priest River from Priest Lake to the confluence with the Pend Oreille River were determined as unsuitable for inclusion in the National Wild and Scenic Rivers System. A report was

[1] USDA Forest Service FS-383, January 2011

submitted to Congress on October 2, 1979. No action was taken on the report. The process to bring the Upper Priest River before Congress was initiated by the Washington Office again in 1993 but was discontinued. This river is now included as an eligible wild and scenic river under the revised Forest Plan. See the discussion below on eligible rivers.

Eligible Rivers

The final EIS for the 1987 IPNF Forest Plan and Amendment #3 signed in 1992 identified six rivers or streams as eligible for inclusion in the National Wild and Scenic Rivers System. They are:

1) Little North Fork of the Clearwater River
2) Little North Fork of the Coeur d'Alene River
3) North Fork of the Coeur d'Alene River
4) Coeur d'Alene River
5) Pack River
6) Long Canyon Creek

In the 1987 Forest Plan for the IPNF, the St. Joe River and the Upper Priest River were allocated to MA12 (Wild and Scenic River Systems) and were described and displayed on management area maps. Eligible rivers were not allocated to MA12, but were discussed in the accompanying EIS.

As per the Wild and Scenic River Act at 5(d) (1) and Forest Service Manual policy (FSM 1924.03), a systematic inventory has been completed on the IPNF. The inventory of named rivers and streams on the IPNF resulted in the identification of 1,337 candidates to consider for eligibility: Bonners Ferry District (145), Priest Lake District (123), Sandpoint District (142), Coeur d’Alene District (561), and St. Joe District (366). An assessment of these 1,337 candidates was conducted to identify any potential outstandingly remarkable values and their free-flowing characteristics. As a result of this assessment, it was determined that there were two additional rivers and streams eligible for inclusion in the National Wild and Scenic Rivers System. These additions are summarized in table 136.

The 1987 IPNF Forest Plan did not contain any monitoring items in relation to eligible, suitable, or designated Wild and Scenic Rivers. The direction provided in the ROD was to “…preserve future options for Recreational/Scenic/Wild Congressional classification.”

To this end, projects were designed and implemented so the identified outstandingly remarkable values would not be compromised, until such time as a suitability study could be conducted. As a result, the free-flowing characteristic of all eligible rivers has been maintained. In addition, management actions taken to comply with state water quality goals and INFISH direction have resulted in the protection of those rivers and streams where fisheries were the identified outstandingly remarkable value.

Table 135 summarizes the eligible rivers that were included in the 1987 IPNF Forest Plan and 1992 amendment. Figure 35 displays their location (use the map code listed in table 135 as a reference to figure 35).

Table 135. Summary of Eligible Rivers on the IPNF (1987 Forest Plan & Amendment)

River/ Segment(S)	Map Code	Outstandingly Remarkable Value(s)	Length on all Lands (miles)	Length on NFS Lands (miles)	Preliminary Classification	Acres (on NFS lands)
Upper Priest River						
Segment 1	UP1	Recreation, Scenery, Wildlife, Fisheries	19.8	19.8	Wild	5,096
Little North Fork Clearwater River						
Segment 1	LNFC1	Recreation, Fisheries, Wildlife	11.3	7.9	Recreational	2,443
Segment 2	LNFC2		26.1	18.3	Wild	5,852
Segment 3	LNFC3		3.4	0.4	Recreational	39
Coeur d'Alene River						
Segment 1	CDA1	Recreation Historic	7.6	0.0	Recreational	0
Segment 2	CDA2		30.2	0.3	Recreational	395
Little North Fork Coeur d'Alene River						
Segment 1	LNFCDA1	Fisheries	38.2	37.8	Recreational	11,338
North Fork Coeur d'Alene River						
Segment 1	NFCDA1	Scenery, Recreation, Fisheries	9.2	9.2	Recreational	2,904
Segment 2	NFCDA2		15.6	15.6	Wild	4,454
Segment 3	NFCDA3		52.2	35.0	Recreational	11,268
Pack River						
Segment 1	P1	Recreation	15.3	13.7	Recreational	4,262
Long Canyon Creek						
Segment 1	LC1	Wildlife	15.2	14.1	Wild	4,488
Total*			**244.10***	**172.1***		**52,539***

* Lengths and acres are a result of using current GIS methodologies.

Environmental Consequences

General Effects

Alternative A – No-action Alternative

Under Alternative A there would be no new river miles identified as eligible on the IPNF. The 1987 ROD and amended Plan identified approximately 172 miles of rivers on NFS lands (and the associated corridors containing about 52,539 acres) on the IPNF as eligible for study as additions to the National Wild and Scenic River system (see table 135).

Alternative B Modified, C, and D

In addition to the existing eligible rivers (see table 135) identified in the 1987 ROD and Amendment #3, Alternatives B Modified, C, and D identifies approximately 21 additional miles of river (and the associated corridors containing about 5,185 acres) as eligible for study as additions to the National Wild and Scenic River System (see table 136

Table 136 summarizes the additional eligible rivers by alternative. Figure 35 displays their location (use the map code listed in table 136 as a reference to figure 35).

Table 136. IPNF Rivers Identified as Eligible during Plan Revision Analysis

River/Segment(S)	Map Code	Outstandingly Remarkable Value(s)	Length on all Lands (miles)	Length on NFS Lands (miles)	Preliminary Classification	Acres (on NFS lands)
Hughes Fork						
Segment 1	H1	Scenery, Recreation, Wildlife, History, Botany	4.8	4.8	Wild	1,562
Segment 2	H2		9.9	9.9	Recreational	2,410
Kootenai						
Segment 1	K6	Scenery Fisheries	6.6	6.5	Recreational	1,213
Total*			**21.2**	**21.2**		**5,185**

Under Alternatives B Modified, C, and D designated rivers would be allocated to MA2a and eligible rivers would be allocated to MA2b. Designated rivers (MA2a) total approximately 70 miles and include approximately 21,290 acres within the St**.** Joe designated corridor. These numbers are based on current GIS analysis. Land Status acres equal 8,198 designated wild and 12,665 designated recreational for a total of 20,863 acres within the designated St**.** Joe Wild and Scenic River Corridor[1].

MA2b, eligible wild and scenic rivers would provide management direction for approximately 193 miles of stream on NFS lands (and the associated corridors containing about 57,724 acres) and would be managed to protect the outstandingly remarkable values for which these rivers are eligible to the National Wild and Scenic River Systems. This direction would apply to those streams identified as eligible in the existing Plan, as well as the 21 additional river miles identified as eligible.

Figure 35 displays the eligible wild, scenic, and recreational rivers on the Forest. See appendix E for narratives and detailed maps of each eligible wild, scenic, and recreational river.

[1] USDA Forest Service FS-383, January 2011

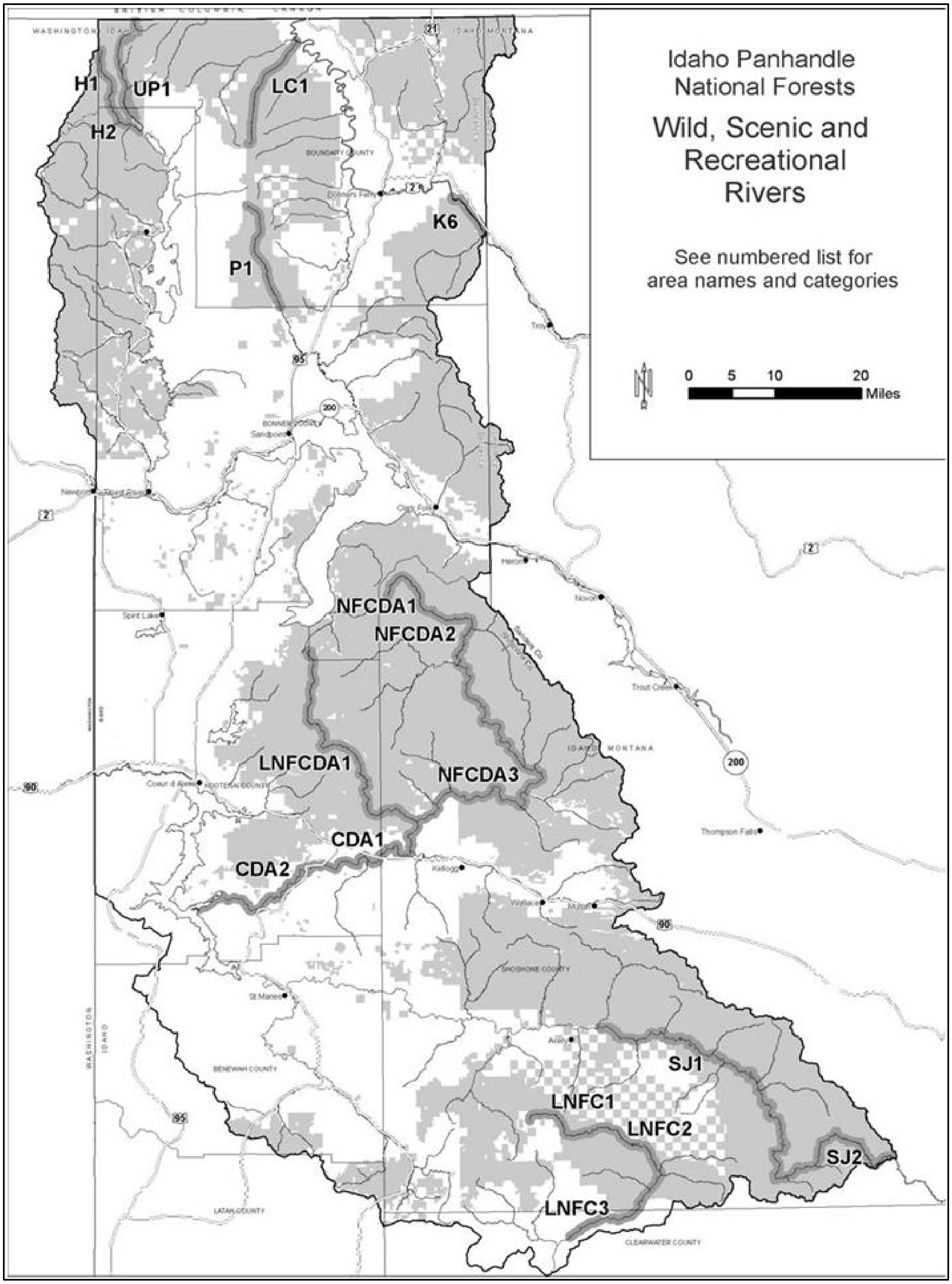


Figure 35. Map of IPNF Established and Eligible Wild, Scenic, and Recreational Rivers

Consequences to Wild and Scenic Rivers from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Management Area Prescriptions

The management area prescription for wild and scenic rivers protects the outstandingly remarkable values for which the river was designated. More areas are protected as eligible for wild and scenic rivers under Alternatives B Modified, C, and D than under Alternative A.

Effects from Vegetation Management

Although all river corridors are removed from calculation of the ASQ, trees could be cut in the eligible river corridors classified as scenic or recreational if it is to maintain or restore the values for which the scenic or recreational river was identified. Within river segments classified as wild, vegetation restoration projects may occur if the need is linked to human-induced changes and are necessary for the recovery of threatened, endangered, sensitive species or native ecological communities (MA2b-GDL-VEG-01). Within recreation river segments, timber harvest is allowed to maintain or restore the values for which the scenic or recreational river was identified (MA2b-STD-TBR-01). Trees would be cut only if they do not alter the recreation characteristics of the land and physical resources and do not affect the eligibility, classification, or potential suitability of the area. For wild and recreational classifications, vegetation alteration outside the areas would be performed in a manner that does not reduce the scenic quality of the river corridor (MA2b-GDL-AR-05 [Eligible Wild River Segments], MA2b-GDL-AR-05[Eligible Recreational River Segments]).

Effects from Recreation Management

Impacts from recreational use and management within eligible river segments are anticipated to be low. Although river corridors may be used for camping, canoeing, hiking, and other activities, the impacts can be expected to be minimal since they are generally low intensity. In order to provide an essentially primitive character, eligible segments classified as wild would not likely have any recreation development occur. In segments classified as scenic or recreational, recreation development would be allowed but only when it would preserve the identified river values. Trail maintenance work can be expected to have little if any impact in the river corridors.

Effects from Fire and Fuels Management

Both natural, unplanned ignitions and prescribed fires are allowed to be used as a tool to maintain ecological conditions within river corridors. These burns could affect scenery in the short-term, but should contribute to meeting long-term scenic objectives and desired future conditions of the MA.

Effects from Minerals Management

Anticipated effects from minerals management would be low in all alternatives. Potential for leasable minerals is low across most of the Forest and currently there are no permits or operating plans for exploration within the corridors. Although potential for locatable minerals does exist, there are no current permits or operating plans for mineral exploration within the corridors. Mineral materials are present and could potentially be used for construction purposes but generally proposals for development of mineral materials do not occur and this would be at the discretion of the Forest Service. Eligible segments classified as wild would not be available for mineral material development.

Cumulative Effects

Cumulative effects evaluate the potential impacts to Wild and Scenic Rivers from the alternatives when combined with past, present, and reasonably foreseeable actions. The lands within the IPNF boundary, and the named rivers and streams contained therein, form the geographic scope for cumulative effects. The temporal bound would be the life of the Forest Plan which is estimated to be a 15 year time span.

In order to integrate the contribution of past actions to the cumulative effects of the proposed action and alternatives, existing conditions are used as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior actions that have affected Wild and Scenic Rivers and might contribute to cumulative effects. On rivers such as the Coeur d'Alene River, which predominantly flows through lands other than NFS lands, there has been continual development on private property. Water-related activities such as fishing, rafting, and kayaking are increasing as the population in nearby urban areas increases and access points are developed.

On rivers that predominantly flow through NFS lands, there has been a steady increase in water-related activities such as fishing, rafting, canoeing, and kayaking, mostly at dispersed sites. An exception to this would be those river sections that do not contain road access.

Management activities generally take place outside of eligible Wild and Scenic Rivers unless an action is needed to help protect or preserve the identified unique feature or characteristic. For example, if invasive weeds were discovered in an eligible river corridor there may be a need to take some action (hand pull, herbicide application) to eradicate or prevent further spread.

Research Natural Areas

Introduction

Research natural areas (RNAs) are permanently established to maintain areas of natural ecosystems and areas of special ecological significance. These protective designations attempt to maintain natural ecosystem components and processes and are cooperatively identified and managed with the USDA Forest Service Rocky Mountain Research Station. These areas form a long-term network of ecological reserves established as baseline areas for non-manipulative research, education, and the maintenance of biodiversity. Most of these areas on the IPNF would protect examples of late-seral or climax conditions. They are administratively designated by the regional forester with station director concurrence.

RNAs Serve Three Important Functions:

- **Reference areas –** RNAs serve as benchmarks for monitoring and evaluating the sustainability and impacts of land management practices on lands with similar ecosystems. To determine the impact of management on an area it is useful to have, as a control, a similar area maintained in natural condition for comparison. RNAs contribute to ecosystem management by providing these controls.
- **Biological diversity –** RNAs provide protection for biological diversity. A representative RNA system provides some degree of assurance that a wide array of plant and animal species will be afforded a high degree of protection in the future. This protection may be most important for soil microorganisms, fungi, insects, and other forms of biological diversity on which ecosystems often depend the most, but about which we know the least. RNAs also can be selected to help protect specific populations of threatened, endangered, and/or sensitive species.
- **Research –** RNAs provide sites for research into how ecosystems function, particularly in areas in which ecological and evolutionary processes are functioning in a relatively natural state. They serve as sites for monitoring long-term change in ecosystems such as global climate change and shifting patterns in the landscape that result from such disturbances as fire, floods, and insect epidemics. Research projects in an identified RNA can greatly increase our understanding of particular ecosystems and improve the quality of ecosystem management. RNAs also serve an important educational function by providing excellent examples of ecosystems in a relatively natural condition, with functioning ecological processes.

Legal and Administrative Framework

Law and Executive Orders

- **Organic Administration Act of June 4, 1897 (16 U.S.C. 477-482, 551):** This act authorizes the Secretary of Agriculture to issue rules and regulations for the occupancy and use of the national forests.

Code of Federal Regulations (CFR)

The following regulations provide direction for RNA establishment and management on NFS lands:

- **36 CFR 219 –** Planning
  - **219.25 Special Designations:** States that forest planning shall provide for the establishment of RNAs. To be identified as examples of important forest, shrubland, grassland, alpine, aquatic, and geologic types that have special or unique characteristics of scientific interest and importance and that are needed to complete the national RNA network.

Methodology and Analysis Process

The IPNF resource specialists and research scientists, along with the Rocky Mountain Research Station, have identified NFS lands on the IPNF that possess ecological characteristics that make them desirable for RNA establishment. In addition to the 20 established RNAs already on the IPNF, the revised Forest Plan would designate three additional RNAs and expand an established RNA.

Changes between Draft and Final

An additional RNA, Fortynine Meadows, would be designated under Alternative B Modified. The Fortynine Meadows RNA encompasses approximately 178 acres and is an undisturbed, high quality, high-elevation peatland (fen) ecosystem. In addition, the boundaries of an existing RNA and a proposed RNA were adjusted and increased in size. The Red Horse Mountain RNA increased 383 acres and the Theriault Lake RNA increased 145 acres. The boundary adjustments were to improve management, make them locatable on the ground, and protect additional areas. These changes in boundaries were made to Alternative B Modified.

Affected Environment (Existing Condition)

There are currently 20 established RNAs on the IPNF (table 137 below). Seven RNAs were established prior to the 1987 IPNF Forest Plan and ROD. The 1987 ROD recommended 13 RNAs for possible establishment. These 20 RNAs totaled approximately 9,200 acres when the ROD was issued in 1987. All 13 RNAs have been officially established since the ROD was signed. Most of these RNAs have had boundaries modified and refined when they were officially established and now total approximately 11,482 acres.

Table 137. Established Research Natural Areas on the IPNF

RNA Name	District	Established (Acres)
Binarch Creek	Priest Lake	653
Bottle Creek	Priest Lake	258
Canyon Creek	Priest Lake	895
Five Lakes Butte	St. Joe	325
Hunt Girl Creek	Bonners Ferry	1,426
Kaniksu Marsh	Priest Lake	172
Montford Creek	Coeur d’Alene River	299
Pond Peak	Coeur d’Alene River	269
Potholes	Priest Lake	305

RNA Name	District	Established (Acres)
Round Top Mountain	Priest Lake	96
Scotchman #2	Sandpoint	1,312
Smith Creek	Bonners Ferry	1,248
Snowy Top	Priest Lake	846
Spion Kop	Coeur d'Alene River	481
Tepee Creek	Priest Lake	614
Theriault Lake	St. Joe	111
Three Ponds	Bonners Ferry	243
Upper Fishhook	St. Joe	318
Upper Shoshone Creek	Coeur d'Alene River	1,306
Wellner Cliffs	Priest Lake	305
Total Acres		**11,482**

Environmental Consequences

General Effects

Alternative A – No-action Alternative

This alternative reflects the 1987 Forest Plan, as amended. Under Alternative A, 20 areas, encompassing 11,482 acres would continue to be managed as RNAs. These areas represent examples of late-successional plant communities, or pristine examples of plant communities that are relatively rare; or unusual complexes of plant communities in very good condition. RNAs are managed under MA14 of the 1987 Forest Plan. This MA provides specific direction for providing areas for non-manipulative research, observation, and study. This MA also generally precludes management activities such as timber harvest (except as identified in research plans) and road construction.

Alternatives B Modified, C, and D

Alternatives B Modified, C, and D retain all existing RNAs. In addition, Alternative B Modified would add three new RNAs and expand an existing RNA, resulting in an increase of about 3,424 acres managed as RNAs. Alternatives C and D would add two new RNAs, resulting in an increase of about 2,713 acres managed as RNAs. See table 138 for a summary of proposed RNAs and acreages by alternative. These areas, along with the existing RNAs, are allocated to MA4a.

Table 138. Proposed Research Natural Areas on the IPNF

RNA Name	District	Alt B Modified Proposed Acres	Alt C and D Proposed Acres
Fortynine Meadows	St. Joe	178	N/A
Red Horse Mountain	Coeur d'Alene	1,657	1,274
Theriault Lake	St. Joe	195[1]	45
Upper Priest River	Priest	1,394	1,394
Total Additional Acres		**3,424**	**2,713**

[1] Addition to an existing RNA (Theriault Lake RNA)

Proposed Research Natural Area Descriptions

Following is a brief description of each of the proposed RNAs. See appendix F for detailed maps of each area.

Fortynine Meadows: This RNA encompasses approximately 178 acres near the headwaters of the Little North Fork of the Clearwater River, south of Avery, Idaho. The aquatic ecosystem is bounded on three sides by regularly traveled forest roads, with forest cover in the areas between the fen meadows and the roads. Fortynine Meadows is an undisturbed, high quality, high-elevation peatland (fen) ecosystem with a low-gradient stream running through it; of the total area, approximately 51 acres is peatland habitat. A substantial portion of the surrounding forest is on very wet mountain hemlock habitat types, and includes plant species dependent on saturated soils. An additional quarter of the peatland habitat extends west onto BLM lands.

Peatlands are uncommon habitats in northern Idaho, and Fortynine Meadows is the only peatland RNA on the IPNF south of the Kaniksu National Forest and south of the area influenced by continental glaciation. This RNA represents the bog birch (*Betula glandulosa*) shrubland type and also support a large population of intermediate-leaved sundew (*Drosera intermedia*), a sensitive plant species in the Northern Region. A number of other plant species found on this site are specialists largely restricted to saturated soils such as peatlands.

Red Horse Mountain: This RNA encompasses approximately 1,657 acres in the upper reaches of Blue Lake Creek, reaching to the top of Red Horse Mountain at the head of the drainage. It lies approximately five miles east of Lake Coeur d'Alene, & approximately three miles north of the lower reaches of the Coeur d'Alene River. Its outstanding features are the upper slopes of several southerly and westerly facing ridges with extensive areas of dry plant communities in unusually pristine condition. One south facing ridge above Cottonwood Creek contains an extensive area of open-grown, old growth ponderosa pine with bunchgrass, and low shrub understory. In-growth of Douglas-fir or dense young pine is relatively minimal. Multiple fire scars are present on some of the older trees. Other dry upper ridges contain significant areas of Idaho fescue, bluebunch wheatgrass, numerous dry site forbs, and low shrubs, with minimal evidence of forest domination. Bank monkeyflower is present.

Dry forests and plant communities like this were once extensive at low elevations in northern Idaho, but are now relatively rare, and examples in good condition are very rare on national forest lands in the Idaho Panhandle.

Theriault Lake expansion: The expansion to this existing RNA is approximately 195 acres, to include the south and southwest face of Marble Mountain. The area was increased to include the water source for Theriault Lake as well as unique geologic and ecologic features, such as large quartzite rocks, a talus slope, and a dwarf quaking aspen forest. The additional acreage, added to the original approximately 111 acres, totals approximately 306 acres.

Upper Priest River: This RNA encompasses approximately 1,394 surveyed acres[1] of floodplain and river terraces, along and between the lower two miles of Upper Priest River and the Hughes Fork down to the mouth of Upper Priest Lake. This RNA was originally proposed in the mid-1970s by the Northern Region Natural Areas committee, and included as a candidate RNA in the 1987 IPNF Forest Plan. Establishment of this RNA was delayed because it required the

[1] Although GIS-calculated acres show an approximate size of 1,396 acres (as listed in the revised EIS table 84) for the Upper Priest River RNA, a 2008 professional survey resulted in on-the-ground boundaries of 1,394 acres.

completion of a land exchange. That land exchange was completed in 1998 for the specific purpose of acquiring lands necessary for the establishment of this RNA. This RNA encompasses the relatively level land between Upper Priest River and the Hughes Fork upstream from their confluence. Included are riparian floodplain lands along the two rivers, isolated oxbows in various stages of filling, and a series of old river terraces that become drier with increasing elevation. Ancient western redcedar forests, extremely wet habitat types of western redcedar/maidenhair fern, and a diversity of rare plant species (including rare lichens) distinguish this area. Rare plants in the area include Anderson's sword-fern, lance-leafed moonwort, Mingan moonwort, maidenhair berry, jelly lichen, and northern beechfern. This RNA features some of the most outstanding ancient cedar groves in the Northern Rocky Mountains. Included are extensive areas of old growth cedar/hemlock forest, in conjunction with unusually diverse rare plant communities; some unique plant populations for northern Idaho, 21 different vegetation stand types; pristine shrub carr and riparian hardwood communities; several miles of pristine river channel; and a rich wildlife presence. The RNA includes the riparian floodplain lands along the two rivers, isolated oxbows in various stages of filling, and a series of old river terraces that become drier with increasing elevation. Five rare plants species are known to be present within this area: northern beechfern, Braun's sword-fern, arrowleaf coltsfoot, black snake-root, and Krushea twisted-stalk. The northern beechfern population is the largest known for Idaho. Unusually large populations of skunk cabbage and maidenhair fern, and moonworts are also present.

Consequences to Research Natural Areas from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Management Area Prescriptions

Management prescriptions in any of the four alternatives would not result in any change in the lands managed as RNAs. Areas allocated to RNAs are substantially free from human activities, although research and educational activities occur. Under special circumstances, deliberate manipulation may be used to maintain or re-establish ecological processes within an RNA (i.e., if approved in the RNA management plan or Establishment Record); otherwise most activities are precluded in RNAs.

Effects from Access Management

Currently there are no roads in the existing designated RNAs. The action alternatives would restrict new road construction on an additional 3,424 acres (Alternative B Modified) or 2,713 acres (Alternatives C and D) under MA4a-STD-AR-02. In addition, MA4a includes MA4a-GDL-AR-02 which allows mechanized use (e.g., mountain bikes and other wheeled vehicles) only on NFS routes. These standards and guidelines would protect the natural processes within the RNAs.

Effects from Vegetation Management

MA14 (Alternative A) and MA4a (Alternatives B Modified, C, and D) allow timber harvest only if it is identified in the RNA Establishment Record or approved RNA management plan. These MAs are not part of the suited timber base. Under special circumstances, deliberate manipulation may be used to maintain or re-establish ecological processes within an RNA as allowed within the RNA Establishment Record or approved RNA management plan. Any activity would be designed to meet RNA management objectives.

Effects from Wildlife Management

All alternatives preclude activities that are not allowed by the RNA management plan; therefore, wildlife management in these areas would not occur and would not affect RNAs.

Effects from Aquatic Management

All alternatives preclude activities that are not allowed by the RNA management plan; therefore, aquatic management in these areas would not occur and would not affect RNAs.

Effects from Recreation Management

All alternatives preclude activities that are not allowed by the RNA management plan; therefore, recreation management in these areas would be limited to non-motorized recreation and mechanized use is limited to established trails. These limited recreation activities would not result in any change in the lands recommended as RNAs.

Effects from Fire and Fuels Management

Planned ignitions or the use of unplanned ignitions may be allowed, as described within the RNA Establishment Record or approved RNA management plan. Fire would only be allowed if it would maintain or re-establish ecological processes within the RNAs.

Effects from Lands and Special Uses Management

All alternatives preclude activities that are not allowed by the RNA management plan; therefore, lands and special use management would not occur and would not affect RNAs.

Cumulative Effects

Management activities generally take place outside of established or recommended RNAs unless an action is needed to help protect or preserve the identified ecological characteristics. For example, if invasive weeds were discovered in an RNA there may be a need to take some action (hand pull, herbicide application) to eradicate or prevent further spread. However, this activity, or any management activity, would have to be identified in the RNA Establishment Record or approved RNA management plan or analyzed at the site-specific level.

Vegetation treatments are likely to continue. It is not expected that vegetation management activities resulting from any of the four alternatives would likely result in any change to established or recommended RNAs since vegetation treatments take place outside of RNAs. Any vegetative treatment within RNAs would be analyzed at the site-specific level and be identified in the RNA Establishment Record or approved RNA management plan.

Wildlife management activities can be expected to continue but are not likely to result in any change to established or recommended RNAs since wildlife management activities occur outside of RNAs.

Watershed improvement activities are likely to continue. It is unlikely that any aquatic management activities resulting from any of the four alternatives would likely result in any change to established or recommended RNAs since watershed improvement activities generally take place outside of RNAs.

Recreation management activities such as trail maintenance can be expected to continue but are not likely to have any effect on any established or recommended RNAs.

Fuels management activities (e.g., prescribed burning) are likely to continue. It is unlikely that fire and fuels management activities resulting from any of the four alternatives would likely result in any change to established or recommended RNAs since fuels management activities generally take place outside of RNAs.

Special Areas

Introduction

The areas discussed in this section are comprised of the Special Area classifications listed below. Special Areas are protected and managed for public use and enjoyment. These areas are identified due to their unique or special characteristics. Special Areas are ‘suitable areas of national forest land, other than wilderness or wild areas, which should be managed principally for recreation use…”(36 CFR 294.1). These areas are not congressionally designated, but are administratively designated by the Chief of the Forest Service, regional forester, or forest supervisor (FSM 2372).

The following are Special Area classifications, depending on their special characteristics or unique value(s):

1. Scenic Area – a unit of land with outstanding natural beauty that requires special management to preserve this beauty.
2. Geological Area – a unit of land with outstanding formations or unique geological features of the earth's development such as caves, fossils, dikes, cliffs, or faults.
3. Botanical Area – a unit of land that contains plant specimens, plant groups, or plant communities that are significant because of their form, color, occurrence, habitat, location, life history, arrangement, ecology, rarity, or other features.
4. Zoological Area – a unit of land that contains animal specimens, animal groups, or animal communities that are significant because of their occurrence, habitat, location, life history, ecology, rarity, or other features.
5. Paleontological Areas – a unit of land that contains fossils of plants and animals, shellfish, early vertebrates, coal swamp forests, early reptiles, dinosaurs, and other prehistoric plants or animals.
6. Historical Area – a unit of land possessing a significant site or a concentration of sites, buildings, structures, or objects united historically or prehistorically by plan or physical development. Memorial areas are included in this definition.
7. Recreational Area – a unit of land that has been administratively designated for particular recreation opportunities or activities such as hiking, rock hounding, recreational mining, photography, or other special activity.
8. Pioneer Area – a unit of land that is recognized for its unroaded, scenic, recreational, wildlife, and watershed values intended to provide a primitive recreation experience and maintain an undeveloped setting.

The IPNF did not identify any Special Areas with zoological, paleontological, or historical values.

Legal and Administrative Framework

Law and Executive Orders

- **Organic Administration Act of June 4, 1897 (16 U.S.C. 477-482, 551)**: This act authorizes the Secretary of Agriculture to issue rules and regulations for the occupancy and use of the national forests.

Code of Federal Regulations (CFR)

The following regulations provide direction for Special Area designation and management on NFS lands:

- **36 CFR 219 –** Planning
  - Subpart A: National Forest land and Resource Management Planning
- **36 CFR 294 –** Special Areas
  - Subpart A: Miscellaneous Provisions
  - Subpart B: State Petitions for Inventoried Roadless Area Management
  - Subpart C: Idaho Roadless Area Management

Key Indicator

- Acres of NFS lands recommended for designation as Special Areas.

Methodology and Analysis Process

Resource specialists across the Forest, through field data collection and inventory work, identified NFS lands that possess ‘Special Area’ characteristics and submitted them to be recommended for designation.

For the purposes of this analysis the total acres of all recommended areas is calculated for each alternative and compared. This includes new areas as well as the expansion of some of the existing Special Areas. See appendix F for more information on the process used to identify these areas.

Analysis Area

The analysis area is the NFS lands administered by the IPNF.

Changes between Draft and Final

The boundaries of one recommended (Bath Creek Gorge) and one existing (Roosevelt Cedar Grover/Granite Falls) special area were expanded under Alternative B Modified. These expansions were made to include important adjacent areas and to improve manageability. See appendix F for a description of these proposed expansions. In addition, the proposed expansion of the Mallard Larkins Pioneer Area in the DEIS was dropped under Alternative B Modified. This alternative allocates the Mallard Larkins area to recommended wilderness (MA1b), as well as retaining the existing special area. Thus, no expansion of this special area is proposed under Alternative B Modified.

Affected Environment (Existing Condition)

There are currently nine designated Special Areas on the IPNF (see table 139 below). Descriptions and maps of these Special Areas are included in appendix F.

Table 139. Designated Special Areas on the IPNF

Name	District	Existing (Acres)	Classification
Copper Falls	Bonners Ferry	40	Geological
Hanna Flats Botanical Area	Priest Lake	16	Botanical
Hobo Cedar Grove Botanical	St. Joe	232	Botanical

Name	District	Existing (Acres)	Classification
Area			
Mallard Larkins Pioneer Area	St. Joe	13,948	Pioneer
Northwest Peaks Scenic Area	Bonners Ferry	1,972	Scenic
Roosevelt Grove of Ancient Cedars Scenic Area and Granite Falls Geologic Area	Priest Lake	139	Scenic/Geological
Sandhouse Cedar Grove	St. Joe	120	Botanical
Settlers Grove of Ancient Cedars Botanical Area	Coeur d'Alene River	182	Botanical
Upper Priest Lake Scenic Area	Priest Lake	4,696	Scenic
Total Acres		**21,345**	

Environmental Consequences

General Effects

Alternative A – No-action Alternative

As opposed to the action alternatives, this alternative does not designate any new or expand any existing Special Areas. The nine existing Special Areas listed above in table 139 would continue to be managed to enhance and/or protect the unique resources and values for which they were previously designated. These areas total approximately 21,345 acres and are allocated to MA13 of the 1987 Forest Plan.

Alternative B Modified, C, and D

In addition to retaining the existing designated Special Areas, Alternatives B Modified, C, and D designate an additional four new Special Areas and expand the size of some of the Special Areas that were previously established.

Alternative B Modified: This alternative would designate four new Special Areas for an additional 7,917 acres, and would expand the size of three existing Special Areas by 3,285 acres. Alternative B Modified would result in a total of 11,202 acres added as special areas. Table 140 lists the recommended Special Areas, and the additions to existing Special Areas for this alternative. These additional acres would be allocated to MA3 along with the existing Special Areas, resulting in a total acreage of 32,547 acres within MA3.

Table 140. Recommended Special Areas on the IPNF for Alternative B Modified

Name	District	Recommended (Acres)	Classification
Bath Creek Gorge	Priest Lake	407	Geological
Emerald Creek	St. Joe	2,350	Recreational
Hobo Cedar Grove Botanical Area	St. Joe	453[1]	Botanical
Huff Lake	Priest Lake	70	Botanical
Northwest Peaks Scenic Area	Bonners Ferry	2,639[1]	Scenic
Roosevelt Cedar Groves/Granite Falls Scenic Area	Priest Lake	193[1]	Scenic
Upper Priest River Botanical Area	Priest Lake	5,090	Botanical
Total Acres		**11,202**	

[1] Additional acres recommended for adding to existing Special Areas

Alternatives C and D: These alternatives would designate four new Special Areas for an additional 7,764 acres, and would expand the size of four existing Special Areas by 12,248 acres. Therefore, these alternatives would each result in a total of 20,012 acres being added to Special Areas. Table 141 lists the recommended Special Areas and the additions to existing Special Areas for these alternatives. These additional acres would be allocated to MA3 along with the existing Special Areas, resulting in a total acreage of 41,357 within MA3.

Table 141. Recommended Special Areas on the IPNF for Alternatives C and D

Name	District	Recommended (Acres)	Classification
Bath Creek Gorge	Priest Lake	254	Geological
Emerald Creek	St. Joe	2,350	Recreational
Hobo Cedar Grove Botanical Area	St. Joe	453[1]	Botanical
Huff Lake	Priest Lake	70	Botanical
Mallard Larkins Pioneer Area	St. Joe	9,004[1]	Pioneer
Northwest Peaks Scenic Area	Bonners Ferry	2,639[1]	Scenic
Roosevelt Grove of Ancient Cedars Scenic Area and Granite Falls Geologic Area	Priest Lake	152[1]	Scenic/Geological
Upper Priest River Botanical Area	Priest Lake	5,090	Botanical
Total Acres		**20,012**	

[1] Additional acres recommended for adding to existing Special Areas

Consequences to Special Areas from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Management Area Prescriptions

The management area prescription for special areas protects the unique or special values for which the area was identified while providing recreational use. Under Alternative B Modified, additional acreage recommended for special area designation is 11,202 acres. For both Alternatives C and D, additional acreage recommended for special area designation is 20,012. Alternative A would not increase existing Special Areas or add new ones.

Effects from Vegetation Management

Special areas are not suitable for timber production. Timber harvest is not allowed in these areas, with the exception of Emerald Creek. Timber harvest in Emerald Creek would be to maintain or restore its values as a special area. Natural ecological processes (e.g., plant succession) and disturbances (e.g., insects and disease) are the primary forces affecting the composition, structure, and pattern of vegetation within special areas.

Effects from Recreation Management

Impacts from recreational use and management within Special Areas are anticipated to be low. Hiking and other activities occur, but the impacts can be expected to be minimal since they are generally low intensity. Developed recreation sites are unlikely, although trailhead and sanitation facilities can be expected in many of these areas. Trail maintenance work can be expected to have little, if any, impact on Special Areas characteristics.

Effects from Fire and Fuels Management

Impacts from fire and fuels management are expected to be low. Prescribed fire, although allowed, is rarely used unless the values for which the area was designated can be maintained or enhanced. Unplanned ignitions would generally be suppressed in botanical, geological, and recreational Special Areas as the potential risk to the resource from wildfire would be undesirable.

Effects from Minerals Management

Anticipated effects from minerals management would be low in all alternatives. Potential for leasable minerals is low across most of the Forest and currently there are no permits or operating plans for exploration within any Special Area. Although potential for locatable minerals does exist, there are no current permits or operating plans for mineral exploration within these areas. No impacts would occur from the disposal of mineral materials since it is not an allowed use within Special Areas, with the exception of the Emerald Creek Recreational Special Area.

Cumulative Effects

Cumulative effects evaluate the potential impacts to Special Areas from the proposed action and alternatives when combined with past, present, and reasonably foreseeable actions. The lands within the IPNF boundary form the geographic scope for cumulative effects since this is the scope for the proposed action (Alternative B Modified). The temporal bound would be the life of the Forest Plan which is estimated to be a 15 year time span.

In order to integrate the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis uses existing conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior actions that have affected Special Areas and might contribute to cumulative effects.

Management activities generally take place outside of designated Special Areas unless an action is needed to help protect or preserve the identified unique feature or characteristic. For example, if invasive weeds were discovered in a botanical area there may be a need to take some action (hand pull, herbicide application) to eradicate or prevent further spread.

Vegetation treatments are likely to continue. It is not expected that vegetation management activities resulting from any of the four alternatives would result in any change to designated Special Areas since vegetation treatments generally take place outside of designated Special Areas.

Wildlife management activities can be expected to continue but are not likely to result in any change to designated Special Areas since wildlife management activities generally occur outside of designated Special Areas.

Watershed improvement activities are likely to continue. It is unlikely that any aquatic management activities resulting from any of the four alternatives would result in any change to designated Special Areas since watershed improvement activities generally take place outside of designated Special Areas.

Recreation management activities, such as trail maintenance, can be expected to continue but are not likely to have any effect on any designated Special Areas.

Fuels management activities (e.g., prescribed burning) are likely to continue. It is unlikely that fire and fuels management activities would result in any change to designated Special Areas since fuels management activities generally take place outside of designated Special Areas.

Experimental Forests

Introduction

The IPNF contain two Experimental Forests: the Priest River and Deception Creek. These Experimental Forests are part of a national network of experimental forests, ranges, grasslands, and watersheds that have been authorized by Congress and designated by the Chiefs of the Forest Service since as early as 1908. Currently there are 80 of these experimental areas across the nation that serve to provide sites for long-term research conducted by the Research and Development branch of the Forest Service and its partners (more information is available on the national network of experimental forests at http://www.fs.fed.us/research/efr/).

Staff at the Rocky Mountain Research Station and its research lab in Moscow, Idaho currently manages and directs the research activities that occur on the two experimental forests. Road construction/maintenance, fire suppression, and timber sale contract administration type activities are generally overseen by employees of the IPNF. Memorandums of understanding exist between the Rocky Mountain Research Station and the IPNF identifying specific responsibilities.

The primary purpose of this report is to describe how the various management alternatives presented in this EIS for the revised Forest Plan for the IPNF may influence the management of the existing experimental forests and the research values within them. The AMS that was prepared as part of the Forest Plan revision process did not identify any need for changing Forest Plan direction for the management of the experimental forests.

Legal and Administrative Framework

Law and Executive Orders

- **Organic Administration Act of 1897 (16 U.S.C. 551) and the Forest and Rangeland Renewable Resource Research Act of 1978 (16 U.S.C. 1643):** Authorizes the Secretary of Agriculture to designate experimental forests and ranges. Under regulations at 7 CFR 2.60(a), the Secretary of Agriculture has delegated this authority to the Chief. Forest Service regulations at 36 CFR 251.23 set forth broad direction for establishing and administering these areas. Those regulations state: "The Chief of the Forest Service shall establish and permanently record a series of areas on national forest land to be known as experimental forests or experimental ranges, sufficient in number and size to provide adequately for the research necessary to serve as a basis for the management of forest and range land in each forest region."

Affected Environment (Existing Condition)

These experimental forests were established for a wide variety of manipulative and non-manipulative research. Research projects and management practices that have occurred within these areas have created a wide range of forest conditions from relatively unmanaged conditions to highly managed conditions.

Priest River Experimental Forest was established in 1911 and was one of the first experimental forests to be designated in the nation. Priest River Experimental Forest is approximately 6,200 acres in size and was created for the purposes of researching tree species common to the inland northwest, including western white pine. It is located approximately 10 to 12 air miles northeast of the community of Priest River, Idaho and lies in the southern Selkirk Mountains. Priest River

Experimental Forest has a substantial number of facilities at the headquarters, including an office/lab, residential buildings, a bunkhouse/mess hall, and shop. More information about this experimental forest can be found at the following internet sites: http://www.fs.fed.us/rmrs/experimental-forests/priest-river-experimental-forest and http://forest.moscowfsl.wsu.edu/ef/pref/.

Deception Creek Experimental Forest was established in 1933 in an area that was dominated at that time by large, mature western white pine. When Deception Creek Experimental Forest was designated, it occurred in the heart of the western white pine forest type and research was focused on the ecology and silviculture of western white pine and their associated species. This experimental forest is approximately 3,500 acres in size and is located in the Coeur d'Alene Mountains in the North Fork of the Coeur d'Alene River drainage, approximately10 air miles east and north of the town of Coeur d'Alene, Idaho. More information about this experimental forest can be found at the following internet sites: http://www.fs.fed.us/rmrs/experimental-forests/deception-creek-experimental-forest/ and http://forest.moscowfsl.wsu.edu/ef/dcef.php.

Environmental Consequences

Alternative A – No-action Alternative

This alternative would retain all of the Forest Plan direction contained in the 1987 Forest Plan (as emended to date). In the 1987 Forest Plan the two experimental forests are included into (MA14), along with the RNAs. Direction for the MA is located in pages III-61 through III-64 of the 1987 Forest Plan and focuses on describing what kind of activities are allowable or are suitable within the experimental forests. The underlying purpose for most of the MA direction is to protect the research values within the experimental forests from being harmed.

Alternatives B Modified, C, and D

These action alternatives each contain the same direction for the experimental forests. Forest Plan MA direction under these alternatives is included into MA4b, which is a specific MA designation for the two experimental forests. The management direction for these alternatives that is applicable to the experimental forests is very similar to the direction contained in Alternative A. Most of the direction describes what types of activities are allowable or are suitable and the direction focuses on measures to protect the research values in the experimental forests.

Effects of Forestwide Direction

The alternatives do not contain specific forestwide management direction for the experimental forests; therefore, there are not effects from forestwide direction.

Effects of Management Area Prescriptions

As discussed previously, the management prescriptions for the alternatives do not vary in substantive ways. All MA prescriptions would provide measures to protect the research values that are present in the experimental forests.

Effects of Geographic Area Direction

The GAs that contain the two experimental forests do not contain any specific direction for the management of these areas, thus there are no effects.

Effects of Land Designations

The boundary designations for the experimental forests do not vary by alternative. The boundaries were established when the experimental forests were created and are documented in the respective establishment reports. In addition, the land designations for the areas that surround these experimental forests are also not changing. The adjacent lands have the same general emphasis for management for all alternatives.

Cumulative Effects

As disclosed above, the alternatives would not change or otherwise affect management of the experimental forests and the research values within them. All alternatives have approximately the same measures to protect the research values in these experimental forests; therefore, there are no indirect or cumulative effects.

Cultural Resources

Introduction

Approximately 50 percent of the Forest has been inventoried for cultural resources, and over 2,500 sites have been identified.

Native American occupation of the IPNF began at least 8000 years ago. The areas most intensively used in the prehistoric period are largely concentrated along the major rivers and around the large lakes. Major village sites were established in these areas and smaller special task sites (hunting, fishing, gathering, quarrying, and religious sites) were scattered over a wide variety of environments. Prehistoric sites of known significance include the Harvey Mountain Quarry, currently listed on the National Register of Historic Places, and the Indian Rock Pictographs. Overviews of the Kootenai, Kalispell, and Coeur d'Alene area prehistory in the IPNF were completed in 1981.

In the early 1800s, the historic period began when the Northwest Fur Company started trading in the area. In 1809 David Thompson established a trading post on Lake Pend Oreille. Following Thompson were trappers, missionaries, miners, homesteaders, and loggers who gradually increased the size of the population of north Idaho. The IPNF contains over 2,100 historic sites left by these groups. Those presently on the National Register of Historic Places include the Avery Ranger Station, the Magee Ranger Station, the Snyder Guard Station Historic District, the Red Ives Ranger Station, the Mallard Peak Lookout, Priest River Experimental Forest, the Mullen Road, Bullion Tunnel, and the Vinther/Nelson Cabin. A series of sites associated with the Big Burn of 1910 are also listed on the National Register, including the Pulaski, Edward, Tunnel, and Placer Creek Escape Route, Cedar Snags, Grand Forks, and Halm Creek, Bean Creek Fire. Many other sites have been identified which presumably qualify for the National Register of Historic Places.

Native Americans of the Coeur d’Alene and Kootenai Tribes have resided in the area and utilized the available resources longer than any other local residents. The Coeur d’Alene Tribe is located near the St. Maries Ranger District in the southwestern portion of the Forest. The reservation is approximately 70,000 acres, and in 1970, 360 people lived there. The Tribe uses the Forest for berry picking, hunting, fishing, and religious ceremonies.

There are seven bands of the Kootenai Tribe located in northern Idaho, northwestern Montana, and Canada. There majority of the members of the Tribe reside in Boundary County, Idaho. The Kootenai Reservation consists of a number of allotments reserved from the public domain in the late 1800s, a 12.5 acre parcel deeded to the Tribe after the 1974 War and a number of other scattered parcels. The Kootenai Tribe also uses the IPNF for berry picking, hunting, fishing, and for cultural and religious ceremonies.

The Native Americans of Kootenai County tend to view the Forest for its historical, cultural, and scenic value. In recent years, there has been a more concentrated effort to employ the tribe in forestry related jobs (i.e., thinning and slashing contracts with the Forest Service).

Legal and Administrative Framework

Cultural properties include buildings, sites, areas, and objects having scientific, historic, or social values. They comprise an irreplaceable resource relating past human life.

Law and Executive Orders

- **National Historic Preservation Act (NHPA) of 1966 (amended and expanded in 1976, 1980 and again in 1992):** All other cultural resource management laws and regulations support, clarify, or expand on the NHPA. Federal Regulations 36 CFR 800, 36 CFR 63, and Forest Service Manual 2360 (FSM 2360) contain the basis of specific Forest Service heritage resource management practices. All of these laws, regulations, and direction, guide the Forest Service in identifying, evaluating, and protecting cultural resources on NFS lands. The Forest Service is required to take into account the effect agency actions have on heritage resources that are either determined to be eligible for inclusion in the National Register of Historic Places (NRHP) or cultural resources that are not yet evaluated for eligibility. Eligible cultural resources are termed "historic properties." Specific locations of cultural properties are exempt from disclosure under the Freedom of Information Act pursuant to 5 U.SC. 552(b) (5). In the 1992 amendment it more explicitly incorporated tribal involvement into the Section 106 consultation process and clarified that traditional use sites without physical remains may be eligible for listing in the National Register of Historic Places.
- **The Programmatic Agreement between Region 1 of the Forest Service, the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation. This document was written in consultation with American Indian Tribes, Idaho State Historic Preservation Office, and Advisory Council on Historic Preservation:** It allows streamlining of Section 106 of the NHPA in critical ways, giving much more autonomy to individual forests in working with Idaho State Historic Preservation Office, with less of a role for the Advisory Council on Historic Preservation. The terms of that agreement are fully integrated in the IPNF Heritage program and Survey Inventory Strategy.
- **Archaeological Resources Protection Act of 1979:** Requires tribal notification and consultation where requested in regard to proposed removal of artifacts by permit from public lands.
- **Native American Graves Protection and Repatriation Act of 1990:** Recognizes Native Americans rights regarding Native American human remains and certain cultural objects found on public lands; requiring consultation prior to authorize removal of such items.
- **Religious Freedom Restoration Act of 1993:** Establishes a higher standard for justifying government actions that may impact religious liberties.
- **Executive Order 12898, 1994 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations):** Focuses the attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities.
- **Executive Order 13007, 1996 (Indian Sacred Sites):** Directs federal agencies to the extent practicable, accommodate access to and ceremonial use of, sacred sites by Indian religious practitioners while avoiding adversely affecting the sites and maintaining the confidentiality of the sites.

Key Indicators

- Number of sites potentially disturbed by alternative; and
- Number of acres managed to potentially disturb a single site.

Methodology and Analysis Process

To analyze the existing condition and effects the National Heritage Data Base, INFRA, and the Forest GIS Heritage layers were used to identify acres inventoried to standard and sites that have been documented.

The Heritage GIS layers were used to determine the general number of acres of inventory to locate a single site. The first step was to buffer individual survey transects (CulturalSurveyLine layer) by 15 meters, the general site distance a person can see archaeological and historical sites. This identified adequately inventoried areas on the IPNF. The CulturalSitePoint layer was then buffered in by 100 meters, the general size of most sites, to establish the population of recorded cultural resources. The selection tool was then used to identify the number of sites that overlay adequate inventory transects. The number of acres identified in GIS associated with adequately surveyed transects was divided by the number of sites found that overlay the transect layers. This gave the number of acres, in general, that would need to be inventoried to find a single site. Of course, individual areas of the Forest may have larger or smaller chances of finding sites based on geomorphological units and past use, but for purposes of a general forestwide plan this analysis should suffice.

In order to determine the potential for effect to cultural resources by changes in management alternatives the number of sites per MA and the acres of treatment needed to effect a single site were calculated in much the same manner as described above. In this case the CulturalSitePoint layer was overlain on the management GIS layer for each alternative. The number of sites within each management unit per alternative was calculated and then that number was divided into the number of acres per management unit to calculate the number of acres that could be intensively managed before a site might be affected on average. The only exception was for Alternative A, management unit 18, administrative sites, and where GIS showed no cultural resources. In this case the INFRA layer for facilities was queried to determine the number of administrative sites on the Forest with the assumption that they all held cultural resources, consisting of the facilities themselves. Only those compounds with historic buildings were counted as cultural resources.

Finally, since Alternative A was so different when compared to Alternatives B Modified and D, it was necessary to simplify and model effects. The potential to effect sites in each alternative was tied to the general type of effect: 1) direct project effects; 2) public use and vandalism; and 3) environmental factors (see the “Environmental Consequences General Effects” section for definitions and additional information). A qualitative measure of the effect on cultural resources in general was then determined for each, using “Low”, “Moderate”, and “High” as qualifiers. Each MA in every alternative was given a qualifier for the three general types of effects in a set of two tables, one for Alternative A and one for Alternatives B Modified and D. To compare the four alternatives, those with Low potential were given one point, those for Moderate potential were given two points, and those with High potential were given three points. The totals for all the MAs for each alternative were averaged so that 0 to 1.5 was considered Low, 1.75 was considered Moderate -, 2.0 was considered Moderate, 2.25 was considered Moderate+, 2.5 to 2.75 was considered High - and 3 was considered High. In this way the four alternatives could be compared without bias.

Affected Environment (Existing Condition)

The IPNF has a varied and complex cultural environment that contains prehistoric evidence of at least three American Indian Tribal groups and many different historic site types. According to the Report on Federal Archaeological Program Activities for FY 2010 as developed from the Forest Service INFRA database for tracking cultural resources reporting, over 870,000 acres of the

Forest has been inventoried for cultural resources since the mid-1970s. During those inventories over 2,500 cultural properties have been located and recorded.

Nearly 2,000 cultural resource investigations have been conducted on the Forest for various types of ground disturbing projects. Prior to 1986, over 700 cultural resource investigations were conducted for a total of more than 587,000 acres. From 1986 through 2010 an additional 1,251 cultural resource investigations occurred that covered over 323,000 acres. Unfortunately, the earlier period of cultural resource work in Idaho has generally been determined to no longer meet modern inventory standards. If so, this suggests that upwards of a half million acres need to be re-inventoried. However, the IPNF started using modern inventory forms and reporting methods as early as 1980 with project number 320. Using this threshold, 328 projects of over 310,000 acres do not meet modern standard, leaving 1,648 projects and over 590,000 acres meeting modern standards. This suggests that of the total 2,500,700 acres within the IPNF about 24 percent have been adequately inventoried for cultural resources.

Of the nearly 2,000 investigations cited above, about 920 project areas contain cultural resources. This suggests there is almost a 50 percent chance that a particular project will potentially affect a cultural resource. When the 46,729 acres of adequately documented inventory transects are overlain on known site locations, 525 previously identified sites are noted. This suggests that one site should be found for every 90 acres inventoried. If we divide 2,500,700 acres by 90 acres per site, the total number of potential sites on the IPNF should be approximately 28,000, of which only about 9 percent have been documented to date. This estimate is most certainly too high since sites are not evenly distributed over the Forest due to varying environmental conditions.

Of the 2,500 cultural properties on the IPNF, only about half have been evaluated to the National Register of Historic Places (National Register). Of those sites over 650 are eligible, 27 have been listed on the National Register, and over 700 are ineligible. The remaining 1,100 sites have not been evaluated and must be treated as eligible until such time as evaluations are completed.

There are 31 administrative sites on the IPNF that are counted as cultural resources that have buildings or features at least 50 years of age. These compounds are listed in table 142.

Table 142. Historic Administrative Sites Considered for Effects Analysis

Administrative Site	Year Constructed
Avery Work Center	1909
Big Creek	1926
Bismark Work Center	1909
Burton Cabin	1933
Bonners Ferry Ranger Station	1938
Twin Creek Cabin	1928
Clarkia Work Center	1942
Coeur d’Alene Nursery	1914
Conrad Peak Lookout	1956
Dunn Peak Lo & Comm Site	1958
Fernan Ranger Station	1905
Gisborne Lookout	1958

Administrative Site	Year Constructed
Huckleberry Mtn Lookout	1936
Hughes Meadow Guard Station	1935
Hughes Ridge Lookout	1954
Hugus Creek Powder Mag	1953
Indian Mountain Lookout	1954
Middle Sister Lo & Comm Site	1952
Priest Lake Ranger Station	1954
Saddle Mtn Lookout	1935
Sandpoint RS Service Area	1957
Chickadee Cabin	1915
Mallard Peak Lookout	1929
Simmons Pk Comm Site	1954
Snowy Top Lookout	1930
Spades Lookout	1954
Spyglass Lookout	1954
St. Joe Baldy Elec Site	1953
St. Maries RS Bullpen	1959
Trail Youth Camp	1925
West Fork Smith Cr Lookout	1934
Roundtop Generator Building	1950

Sites are monitored by forest archaeologists, law enforcement, and other field going personnel to determine if vandalism is occurring on the Forest. One formal investigation was undertaken in 2006-7 and several others are ongoing at this time. The Forest has partnered with the Corp of Engineers and the Albeni Falls working group to monitor and protect archaeological sites along Lake Pend Oreille and the Clark Fork River. Discussions with the Bonner County Sheriff's regarding site vandalism are ongoing. The Forest has also worked with the tribes to protect cultural resource sites.

The IPNF has only recently started to allocate sites to management categories and there have been so few entered into INFRA that it is not possible at this time to characterize them to any significant extent. However, there are over 2,500 recorded cultural resource sites on the Forest: over 90 percent of the recorded sites are historic and approximately 10 percent are pre-historic sites associated with American Indian use. Specific consultation regarding this allocation has not taken place with the affected federally recognized Indian Tribes to date and since many traditional people object to scientific study of their sites most may end up in the preservation category. Of the historic period sites generally associated with Euro-American use, about 670 are eligible and another 739 have been unevaluated and will need to be allocated to an appropriate management strategy. The remaining 789 sites are ineligible and can be released from management.

Approximately 20 to 40 sites are monitored a year for condition. At this time, 119 cultural properties have been identified as priority heritage assets; which means they are highly significant, listed on the National Register, are part of a management plan, or the IPNF has promised to monitor them for specific reasons. Of the 119 priority heritage assets in FY 2011, 37 meet standards through monitoring and completing a written condition assessment within the last

5 years. In addition, no deferred maintenance costs are outstanding on these 37 sites. It is unknown how much deferred maintenance is outstanding on the 2,500 sites on the Forest, but recent monitoring efforts suggest that the IPNF's cultural property condition is on a downward trend that would take many multi-millions of dollars of inventory, recordation, and restoration to arrest.

Under the existing Forest Plan, it is possible to characterize general conditions by MA. Those MAs with high potential for direct actions like MA01, 04, 14 (experimental forests), 17, 18 and 19 have a large number of sites that have been recorded and evaluated; but also a larger number of sites that have been damaged by direct project actions not carried out according to the Secretary of the Interior's Standards for Historic Preservation Projects (Secretary's Standards). Conversely, those with low potential for direct project actions and low use have a higher potential for adverse effects owing to lack of management and deterioration due to natural processes. In these areas, historic sites especially, are melting into the forest floor (MA02, 03, 05, 07, 09, 10, 11, 12, 13, 14 (RNAs), and 20. Those with moderate to high use by the public (MA01, 04, 05, 10, 11, 12, 13, 14 (experimental Forests), 17, 18, and 20) are suffering from direct public use and vandalism, especially along roads, trails, ridges, and streams where hunters, campers, hikers, fishermen, and ATV riders camp. Paradoxically, given budgets and staffing, those areas that are more intensively managed have less potential for adverse effect than those areas where there is little or no management activities since cultural resources in these areas are protected through mitigation measures. The rest of the MAs have little hope of successful cultural resource management reducing natural weathering and environmental damage since budgets and staffs are extremely small and the numbers of resources that need management are quite large.

For the last several years public outreach projects have been completed that consist of work with volunteers, museums, interpretive associations, research facilities, and universities to interpret restore and research the history of IPNF managed lands. In 2008 to 2010, 2,360 volunteer hours helped IPNF archaeologists inventory the shores of Priest Lake, restore Mallard Peak Lookout, curate artifacts, scan project reports, and work on National Register nominations. During the same time period over 25 public presentations were provided in local venues across the entire Forest regarding David Thompson, Lewis and Clark, the Civilian Conservation Corp, early logging archaeological sites, and The Big Burn and Pulaski Trail. In 2008, the IPNF Heritage web site was launched to provide annual reports, descriptions of projects, oral histories, reports about the history of the Forest, virtual tours and information for potential volunteers. Partnerships with the Midwest Jesuit Archives, Pulaski Project, Wallace District Mining Museum, Bonner County Historical Museum, Kootenai County Historical Museum, and Priest Lake Historical Museum resulted in public lectures, displays, brochures, interpretive signs, Pulaski Tunnel portal reconstruction, and help with curational issues.

Research on the Forest has been ongoing since the very early years of cultural resource management. Thirty-nine research studies, historic contexts, overviews, oral history documents and management plans have been completed to date. Twelve research oriented inventories have been completed across the Forest to better understand the history and prehistory of the area. In the last several years, four student interns from Slippery Rock University, Eastern Washington University, and Boise State University have been given the opportunity to study and complete research on public lands on logging practices, recreation residence management and national register nominations, the CCC, and geoarchaeology of Luby Bay. Several other historic contexts and studies are underway at the present time and should be completed in the next 1 to 2 years. All site forms and one third to one half of all reports have been converted to pdf format and mapped in GIS, while all sites and reports are in the National Forest Service Database, INFRA, so they are available and accessible to researchers.

Artifacts, photos, maps, site forms, reports, and unpublished manuscripts are held on the Forest and at several institutions. The majority of IPNF archaeological collections are housed in the federally designated and Smithsonian approved Bowers Laboratory of Anthropology at the University of Idaho. Site forms and reports are housed in locked cabinets on the Forest, at the Idaho SHPO's office and Bowers Laboratory. Additional artifacts, maps, photos, manuscripts, and other materials are housed at the forest supervisor's office and in district files. Additional work to bring these materials into compliance with federal regulations is estimated at up to two person years' worth of work. The Museum of North Idaho was given a $10,000 grant several years ago to scan and store much of the Forest's historic photo, map, and manuscript collection; however, additional materials have been located since then that need work. Similar partnerships have been undertaken with the Bonners County, Wallace District Mining, and Priest Lake Museums, although to lesser extents.

However, Section 110 projects have a very low impact on the health of the IPNF cultural resources compared to Section 106 reviewed management activities within highly managed MAs. The future trend suggests there will be even a wider disparity between sites managed under Section 110 and 106 given declining budgets and work force.

Environmental Consequences

General Effects

Effects to cultural resources are caused by direct project actions, public use and vandalism, and natural causes. "Direct project actions" include all of those activities, both beneficial and harmful, that are conducted by the Forest Service or authorized by Forest Service permits, including timber and silvicultural management, prescribed fire, wildlife and fisheries management, road and trail construction, facilities construction and maintenance, recreation use and management, and special uses authorization to third parties. "Public use and vandalism" of historic facilities and archaeological sites can cause the deterioration or destruction of cultural resources. Natural causes include damage by erosion, fire, wind, weathering and other natural processes. The type of cultural resource and the management allocation must be taken into account to determine the significance of the effect.

The criteria for assessing adverse effects under the NHPA are found at 36 CFR 800.5(a) and is defined as:

> *"(1) Criteria of adverse effect:* An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

> *(2) Examples of adverse effects:* Adverse effects on historic properties include, but are not limited to: (i) Physical destruction of or damage to all or part of the property; (ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines; (iii) Removal of the property from its historic location; (iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance; (v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features; (vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and (vii) Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance."

Consequences to Cultural Resources from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects of Forestwide Direction

Effects from Vegetation Management

Vegetation management activities have the potential for some of the most severe effects to cultural resources. Large scale thinning, harvesting, skidding, piling, decking, and construction of service roads have the potential to destroy the integrity of cultural objects, sites, historic districts, and historic landscapes. Therefore, those MAs with high levels of vegetation management may cause severe impacts to cultural resources if not planned and completed according to the Secretary's Standards. Successful implementation of vegetation management projects using the Secretary's Standards can have little or no effect to archaeological and historical sites.

There is a significant amount of difference between Alternative A versus Alternatives B Modified, C, and D. (table 143 and figure 36). Alternatives B Modified, C, and D were analyzed based on treatable acres, not acres within the management unit. Since Alternative A was only analyzed for how many million board feet were harvestable and not how many acres were suitable, the comparison is not the same between the no-action alternative and action alternatives. Alternative A has more sites that may be affected by management actions and as much as 300 more acres treated to impact a single site. The numbers are not directly comparable. Of the action alternatives, Alternative D has the greatest potential to affect cultural resources, although the differences with Alternative B Modified are relatively slight. Alternative C has fewer identified sites, but also fewer treatable acres to affect a single site. In the final analysis, depending on where treatable acres are located in each alternative the difference may be irrelevant.

Table 143. Number of Sites within MAs allowing Vegetation Treatment

Alternative	# of Sites	# of Treatable Acres	# of Acres to Affect Single Site
A	1449	1,507,900	1,041

Alternative	# of Sites	# of Treatable Acres	# of Acres to Affect Single Site
B Modified	1375	951,300	692
C	1341	906,500	676
D	1416	982,300	694

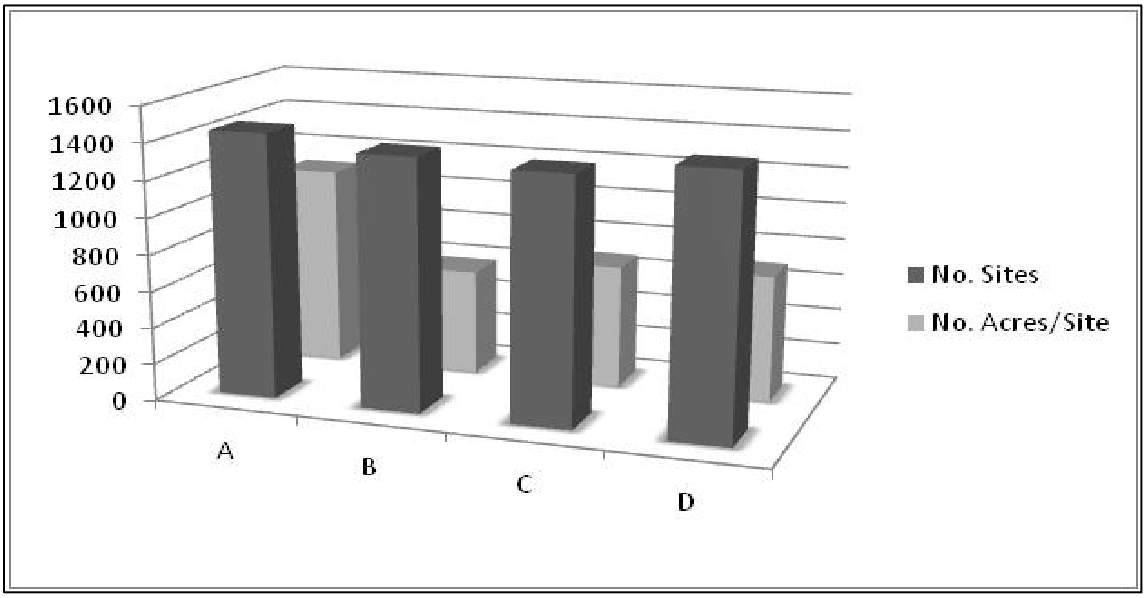


Figure 36. Number of Sites and Number of Acres of Treatment to Impact a Single Site

Effects from Wildlife Management

Wildlife management activities not involving vegetative management have relatively little potential to adversely affect cultural objects, sites, historic districts, and historic landscapes. In some cases, appropriate wildlife management techniques involve vegetative manipulation and or fuels reduction which would have similar consequences to those described in the appropriate sections. Other than road closure, wildlife management actions are small in size and can be moved to avoid cultural resources as per the Secretary's Standards. Closure of historic roads/trails may cause adverse effects through the manner of closure or loss of management that keeps the historic road/trail open and viable. These actions will be concentrated in those MAs which allow road and trail construction. It is not possible to quantify the effects across alternatives for this issue since the data are not available for extant historic roads and trails. However, Alternative D has the greatest amount of land open to active; and therefore, may have more potential for effects to cultural resources.

Effects from Aquatic Management

Aquatic management activities are also relatively small scale, affecting river and stream channels and their adjacent terraces or culvert and bridge configurations to allow for fish passage. Other than historic logging dams and placer workings there are few cultural resources within stream and river channels. Restoration activities may destroy or damage these features. Archaeological and historical sites are commonly found along the terraces of stream channels and may be affected when channel restoration projects restore original or more natural channels. Sites may also be affected by access of equipment across cultural resources and collection of native restoration materials from surrounding areas or rock quarries that have not been inventoried adequately.

Effects from Recreation Management and Road Access

Recreation management activities have the potential to affect objects, sites, historic districts, and historic landscapes. Construction of developed recreation sites may damage or destroy cultural resources and continued management of existing recreation sites that overlay cultural resources can continue to affect those extant portions of cultural resources that were not damaged in the original construction activities or subsequent use. In some cases, the developed recreation site is a historic property (e.g., Shoshone Park Pavilions, recreation cabins and lookouts, and Sam Owen bath house and historic toilets) and must be managed to reduce or eliminate potential adverse effects under the Secretary's Standards. Additional potential to affect cultural resources comes from public use of and occasional construction of minor recreation facilities by the Forest Service in dispersed recreation sites that overlay cultural resources. Construction, reconstruction, and maintenance of recreation roads and trails may also affect cultural resources. Motorized routes tend to cause more damage than horse, bike, and foot trails, but all have potential to partially or totally destroy sites that they are constructed through. Transportation features also provide access to cultural sites, potentially leading to public vandalism and incidental damage from parking and camping off roads. There is no difference between alternatives with respect to developed recreation.

Effects from Fire and Fuels Management

Fire and fuels management activities have the potential to adversely affect cultural objects, sites, historic districts, and landscapes. Prescribed fire and wildfire may destroy historic cultural sites with burnable features, such as cabins, mine structures, lookouts, trail blazes, and administrative sites. With appropriate planning using the Secretary's Standards the potential for impacts to cultural resources from prescribed fire is relatively low, while wildfire is relatively high due to its unplanned nature. Prescribed fire implementation actions and wildfire suppression activities may also adversely affect cultural resources through construction of fire line, backfires, clearing of vegetation, and location of staging areas. Under Alternative A, prescribed and use of natural, unplanned ignitions to meet resource objectives opportunities are limited and fires on most of the Forest would be actively suppressed. Use of natural, unplanned ignitions to meet resource objectives and prescribed fire would be used under all action alternatives with Alternative C having the most use of fire to achieve vegetation desired condition. While Alternative A does not allow for as much protection of cultural resources by prescribed fire and the use of natural, unplanned ignitions, in many cases active suppression is preferable than large scale prescribed fire and use of natural, unplanned ignitions to meet resource objectives to protect historic districts and landscapes from the effects of fire. Under all alternatives known objects and sites may be protected by various suppression techniques.

Effects from Lands and Special Uses Management

Lands and special uses actions have the potential to adversely affect cultural objects, sites, historic districts, and historic landscapes. Sale or trade of lands out of federal ownership, even with management covenants may lead to the damage or destruction of cultural resources by the third party the land is conveyed to. Special uses actions may allow continued or new use of an adverse effect to cultural properties by the permit holder if not managed to the Secretary's Standards. Many special use actions are relatively small compared to other actions and involve less than an acre for access, water, or utility corridors; but they can also affect very large areas, such as in the case of major pipe and power line projects. However, there is no difference among any of the alternatives for management of lands and special uses, so this is not an issue that needs to be analyzed quantitatively.

Effects by Management Area

Two types of analysis were conducted to evaluate the potential to effect cultural resources by MA and alternative. The first was a qualitative description based on a general understanding of the types of actions expected and the potential for these actions to affect cultural resources. The quantitative analysis was split into two parts; the first was a count of sites per MA per alternative and the second was acres of MA treated to affect a single cultural resource. Since Alternative A (table 144) does not directly correlate across all MAs it is analyzed separately from Alternatives B Modified and D, which only vary in size, not management direction.

Table 144. Alternative A: Qualitative Potential for Adverse Effect to Cultural Resources by MA

MA	MA Description	Direct Project Actions	Public Use & Vandalism	Average Effect
MA01	Timber Production	High	Moderate	Moderate+
MA02	Grizzly Bear Habitat	Low	Moderate	Moderate-
MA03	Grizzly Bear Habitat with Big Game Winter Range	Low	Moderate	Moderate-
MA04	Big-Game Winter Range with Timber Production	Moderate	Moderate	Moderate
MA05	Big-Game Winter Range not Suitable for Timber	Low	Moderate	Moderate-
MA06	Elk Summer Range with Timber Production	Moderate	Moderate	Moderate
MA07	Caribou Management	Low	Moderate	Moderate-
MA09	Lands not Tentatively Suitable for Timber Production	Low	Moderate	Moderate-
MA10	Semi-primitive recreation	Moderate	Moderate	Moderate
MA11	Existing and Proposed Wilderness	Low	Moderate	Moderate-
MA12	Wild & Scenic Rivers	Low	Moderate	Moderate-
MA13	Special Areas	Low	Moderate	Moderate-
MA14	RNAs	Low	Low	Low
	Experimental Forests	High	Moderate	Moderate+
MA17	Developed Recreation Sites	High	Low	Moderate
MA18	Administrative Sites	High	Low	Moderate
MA19	Semi-Primitive Recreation and Timber Production	High	Moderate	Moderate+
MA20	Unroaded Semi-Primitive Recreation	Moderate	Moderate	Moderate

For Alternatives B Modified, C, and D the MAs have the same direction and only the size and location of the areas change. Therefore, it is possible to characterize the potential for adverse effect in each MA without respect to alternative (table 145). Since there are fewer MAs and they tend to be grouped with like activity sets it is easier to determine potential effect than for Alternative A. For these alternatives MA4b, 6, and 7 are the most intensively managed and have the highest potential for adversely affecting cultural sites. However, as with Alternative A, MA3, 4b, 5, 6, and 7 with moderate to high use by the public may suffer from direct public use and vandalism, especially along trails, ridges and streams, rivers, lakes where hunters, campers, hikers, fishermen, and ATV riders dispersed camp and where long established developed recreation sites may not have been inventoried. Along trails, streams, rivers, and lakes in more remote areas where public activities are concentrated, dispersed camping may have significant effects to cultural resources when not managed appropriately.

Table 145. Alternatives B Modified-D: Qualitative Potential for Adverse Effect to Cultural Resources by MA

MA	MA Description	Direct Project Actions	Public Use & Vandalism	Average Effect
MA1a	Wilderness, Designated	Low	Moderate	Moderate-
MA1b	Wilderness, Recommended	Low	Moderate	Moderate-
MA1c	Wilderness Study Area	Low	Moderate	Moderate-
MA1e	Primitive Lands	Low	Moderate	Moderate-
MA2a	Designated W&S Rivers	Low	Moderate	Moderate-
MA2b	Eligible W&S Rivers	Low	Moderate	Moderate-
MA3	Special Areas	Moderate	Moderate	Moderate
MA4a	RNA	Low	Moderate	Moderate-
MA4b	Experimental Forests	High	Moderate	Moderate+
MA5	Back Country	Moderate	Moderate	Moderate
MA6	General Forest	High	Moderate	Moderate+
MA7	Primary Recreation Areas	High	High	High

To better understand the actual quantitative measure of Alternative A the number of sites and acres of management necessary to impact a single site were calculated (table 146 and figures 37 and 38). The large number of sites within MAs, like 01, 02, 04, and 09 would suggest that site impacts would be relatively more likely than the remaining MAs, which have less than 100 sites each. The higher level of management activities in MA01 and 04 may affect cultural resources more than MA02 and 09 that have little or no potential for management. See figure 38 for the number of acres that can be used by the public prior to affecting a single site. It is suggested that MA1 can be managed fairly heavily without damaging a site, while MA05, 10, 11, 12, 13, and 20 have quite low ratios of acres managed per site potentially affected, that might mean given intense and uncontrolled public use a larger number of sites would be affected in these MAs. Those sites in MA3, 9, and 14 (RNA) have little chance of active management since few, if any, projects or funds occur in these MAs.

Table 146. Alternative A: Sites, Acreage, Acres of Treatment to Effect One Site and MA Summary

MA	# Sites	# Acres	Acres/Site	Management Area Description	Average Effect
MA01	889	950,400	1,069	Timber Production	Moderate+
MA02	135	165,100	1,223	Grizzly Bear Habitat	Moderate
MA03	43	17,500	407	GB Habitat & Winter Range	Moderate+
MA04	440	272,300	619	Winter Range with Timber Prod	Moderate

MA	# Sites	# Acres	Acres/Site	Management Area Description	Average Effect
MA05	20	12,300	615	Winter Range without Timber Prod	Moderate+
MA06	61	240,900	3,949	Elk Summer with Timber Prod	Moderate
MA07	35	122,300	3,494	Caribou Management	Moderate+
MA09	282	266,200	944	Not Suitable for Timber Prod	Moderate+
MA10	47	125,100	2,662	Semi-Primitive Recreation	High-
MA11	25	153,900	6,156	Existing & Proposed Wilderness	Moderate+
MA12	54	29,100	539	Wild & Scenic Rivers	Moderate
13	9	6,800	756	Special Areas	Moderate+
14	23	18,100	787	RNAs and Experimental Forests	Moderate
17	16	1,700	106	Developed Recreation Sites	Moderate-
18	31	500	16	Admin Sites	Moderate-
19	12	50,000	4,167	Semi-Primitive Rec & Timber Prod	Moderate+
20	10	65,500	6,550	Unroaded Semi-Primitive Recreation	High-

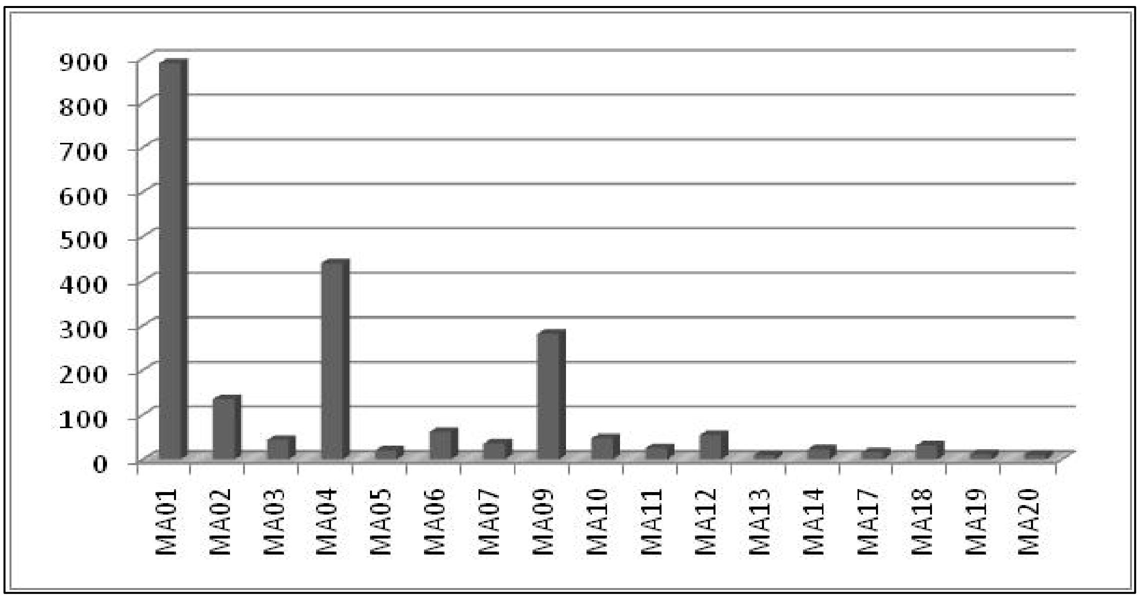


Figure 37. Alternative A: Number of Sites per Management Area

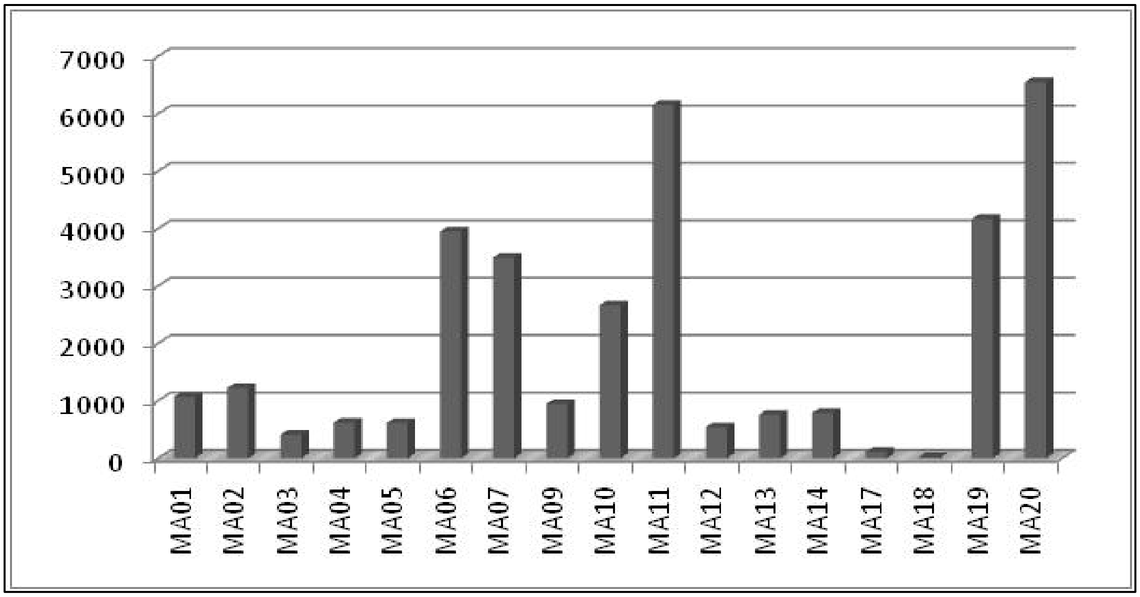


Figure 38. Alternative A: Number of Acres Treated to Affect a Single Site

Alternatives B Modified, C, and D share the same management direction. They differ mostly by the size and location of the MA (table 147 and figure 39). When you consider site numbers by MA and Alternatives B Modified, C, and D, Alternative C MA1b seems to have significantly more sites than the other two alternatives by over 2.6 times (0.94:1:2.9). However, given this is recommended wilderness, active management potential is low except along trails. Public use along trails and camp sites at streams, rivers, and lakes would be relatively high, suggesting increased potential for adverse effects. The ratio of difference between MA5 Alternatives B Modified, C, and D is 1.1:1:0.91, suggesting that Alternative B Modified would have slightly more potential for impact of cultural resources than C or D. For MA6, there is hardly any significant difference, for each alternative's number of sites and potential for effect. There is no significant difference between the other alternatives.

Table 147. Site Numbers by MA and Alternative

MA	Alt B Modified	Alt C	Alt D	Designation Description	Average Effect
MA1a	1	1	1	Wilderness, Designated	Moderate-
MA1b	31	83	29	Wilderness, Recommended	Moderate-
MA1c	5	5	5	Wilderness Study Area	Moderate-
MA1e	5	0	0	Primitive Lands	Moderate-
MA2a	50	50	50	Designated W&S Rivers	Moderate-
MA2b	87	83	87	Eligible W&S Rivers	Moderate-
MA3	21	16	21	Special Areas	Moderate
MA4a	11	11	11	RNA	Moderate-
MA4b	14	14	14	Experimental Forests	Moderate+
MA5	260	244	222	Back Country	Moderate
MA6	1,375	1,341	1,416	General Forest	Moderate+
MA7	43	43	43	Primary Recreation Areas	High

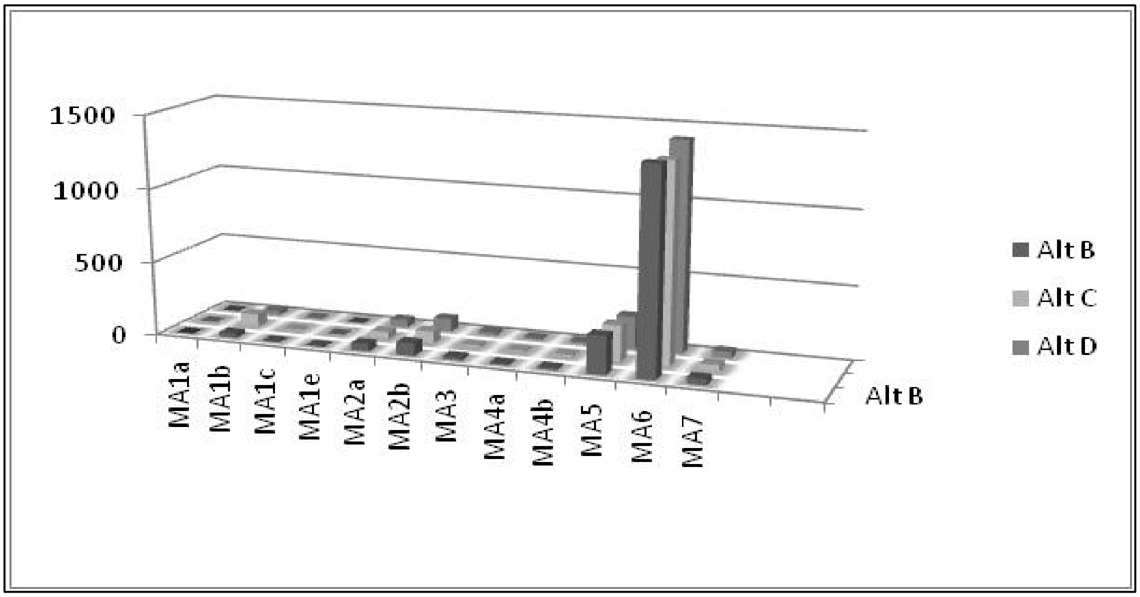


Figure 39. Comparison of Site Numbers by MA and Alternative

When considering the number of acres managed to affect a single site there are some slightly more significant differences (table 148 and figure 40). MA1b has significantly more sites that may be affected per number of acres used by the public along trails and in dispersed camps in Alternative C than the others. Since there is a difference of 50 sites between Alternative C and the other alternatives this alternative has a moderate significance for effect. For MA1e, the difference is even more evident. However, since there are only five sites involved, the difference is insignificant when considering the entire population of sites. For MA2b the difference is also negligible. For MA3 the difference between alternatives is insignificant, given only effects to 21 sites are considered. For MA5 the difference between alternatives is barely significant, given there is a difference of only 40 sites between Alternatives B Modified and D. For MA6 the difference between sites is barely significant with nearly 80 sites difference between Alternatives C and D. For this MA, mitigation measures would need to be employed to protect sites from direct management actions, like timbers sales and restoration projects and indirect and direct effects of public use along roads, trails, streams, rivers, lakes, and ridge tops. There is no statistical difference in the other alternatives.

Table 148. Number of Acres Managed to Affect a Single Site by Alternative

MA	Alt B Modified	Alt C	Alt D	Designation Description	Average Effect
MA1a	9,900	9,900	9,900	Wilderness, Designated	Moderate-
MA1b	4,197	1,567	4,486	Wilderness, Recommended	Moderate-
MA1c	1,380	1,380	1,380	Wilderness Study Area	Moderate-
MA1e	4,280	21,400	21,400	Primitive Lands	Moderate-
MA2a	428	428	428	Designated W&S Rivers	Moderate-
MA2b	553	580	553	Eligible W&S Rivers	Moderate-
MA3	1,686	2,213	1,686	Special Areas	Moderate

MA	Alt B Modified	Alt C	Alt D	Designation Description	Average Effect
MA4a	1,282	1,282	1,282	RNA	Moderate-
MA4b	586	586	586	Experimental Forests	Moderate+
MA5	2,620	2,792	3,068	Back Country	Moderate
MA6	1,097	1,124	1,065	General Forest	Moderate+
MA7	305	305	305	Primary Recreation Areas	High

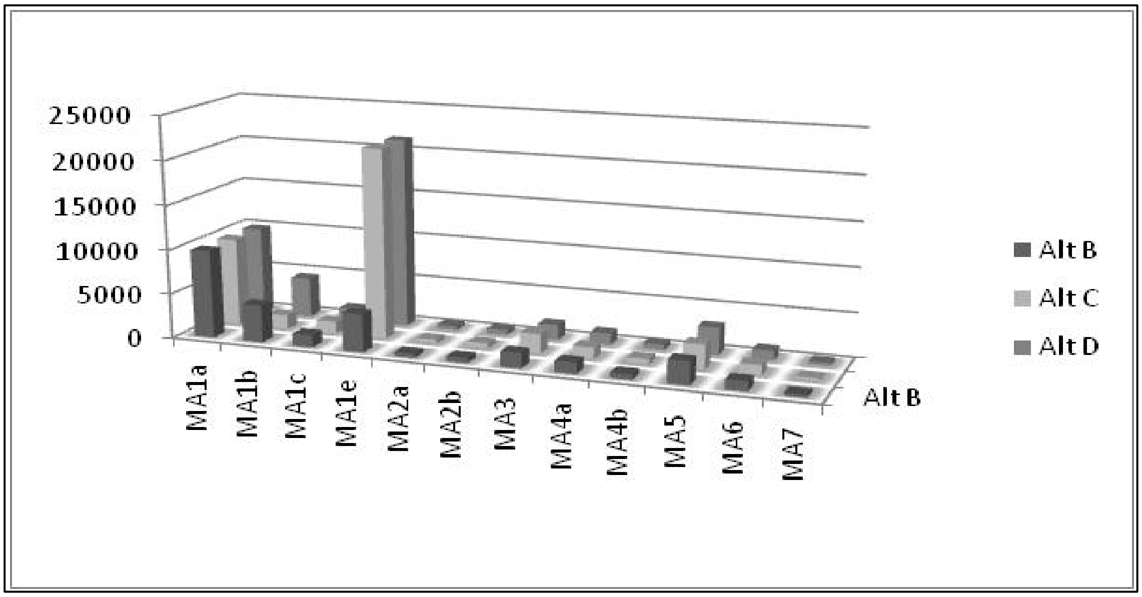


Figure 40. Comparison of Number of Acres Managed to Potentially Affect one Site for each MA and Alternative

Finally, when we try to compare alternative effects across all four alternatives it is necessary to simplify the analysis and look at effect classes (table 149 and figure 41). There were no alternatives which scored in the Low-class for number of sites potentially affected while only Alternative A had any sites in the Moderate-class. In the Alternative A Moderate class there is a significantly higher potential for adverse effects in this alternative, especially since there are 656 sites difference between Alternative A and each of the other alternatives. In the Moderate+ class there is a difference of 284 sites between Alternatives A and D and about 250 sites each between Alternatives A and B Modified/C. Finally, for the High-class there was a difference of less than twenty sites between Alternatives A and B Modified, but around 200 site differences between Alternatives A and C/D. Clearly Alternatives C and D have the potential to affect more sites than Alternatives A and B Modified. While the differences between Alternatives A and B Modified are small, it appears that Alternative B Modified may have a slightly higher potential to affect sites.

Table 149. Comparison of Potential Adverse Effect Classes by Number of Sites for Each Alternative

Alternative	Low	Moderate-	Moderate	Moderate+	High-
Alt A	0	47	713	1,315	57

Alternative	Low	Moderate-	Moderate	Moderate+	High-
Alt B Modified	0	190	281	1,389	43
Alt C	0	238	260	1,355	43
Alt D	0	183	243	1,430	43

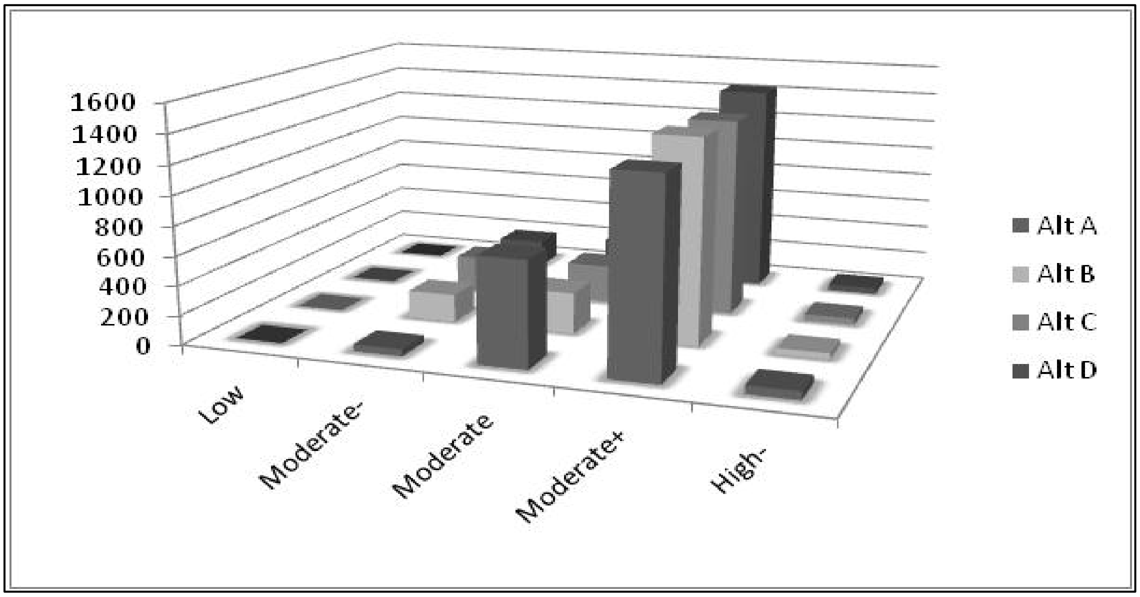


Figure 41. Comparison of Potential Adverse Effect Classes by Number of Sites for each Alternative

When the number of acres treated/left unmanaged by MA is considered, the trend clearly favors the no-action alternative (table 150 and figure 42). Again, there are no alternatives that have a low potential to effect sites. Alternative A, again, is the only alternative with a potential to effect in the Moderate-class. In the Moderate-class the difference is 644 acres to find a single site between Alternatives A and B Modified and nearly a thousand acres between A and C/D. In the Moderate+ class the difference is less than 100 acres managed/left unmanaged between Alternative A and the others. In the High-class the difference of nearly 800 acres per site between Alternatives A and B Modified and about 400 acres per site treated/left unmanaged between Alternatives A and D is significant. Alternative A, has a significantly sparser number of sites per acre treated in MAs with intensive management. These figures may also indicate significantly fewer sites that may suffer in classes that have indirect impacts, such as dispersed recreation use. Alternative B Modified is not significantly different in number of acres treated to affect a single site given the higher numbers in the Moderate-class tends to balance out the lower numbers in the High-class. Therefore it is difficult to say there is a significant difference between the Alternatives B Modified, C, and D.

Table 150. Comparison of Potential Adverse Effect Classes by Acres Treated to Impact a Single Site for Each Alternative

Alternative	Low	Moderate-	Moderate	Moderate+	High
Alt A	0	46	1,018	1,201	3,344
Alt B Modified	0	0	374	1,124	2,551
Alt C	0	0	14	1,118	2,756

Alternative	Low	Moderate-	Moderate	Moderate+	High
Alt D	0	0	13	1,101	2,949

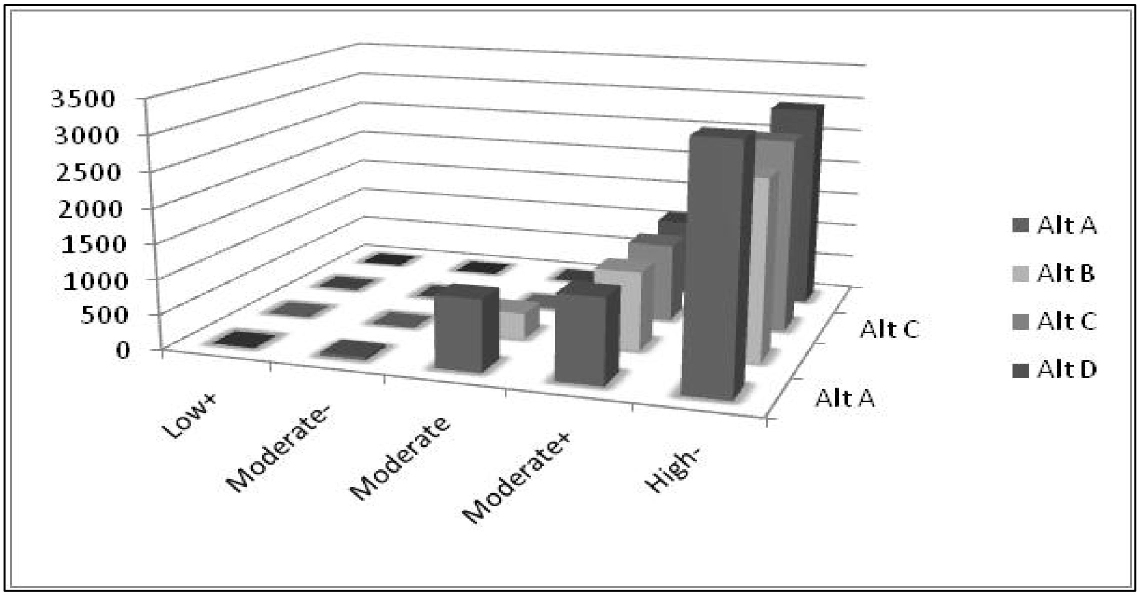


Figure 42. Comparison of Potential Adverse Effect Classes by Acres Treated to Impact a Single Site for each Alternative

Of the potential effects to cultural resources Alternative A appears to have a significantly smaller impact than the remainder, with Alternative B Modified having the second smallest overall potential for impacts, although the differences are minimal. This conclusion requires appropriate design criteria be implemented for those MAs with intensive management objectives so that the cultural resource objectives for sites are met through inventory, recordation, and enhancement over time through project actions, rather than loss of site characteristics through time by benign neglect.

Cumulative Effects

Cumulative effects evaluate the potential impacts to cultural resources from the proposed action when combined with past, present, and reasonably foreseeable actions. The lands within the IPNF boundary form the geographic scope for cumulative effects since this is the scope for the proposed action (Alternative B Modified). The temporal bound would be the life of the Forest Plan which is estimated to be a 15 year time span.

In order to understand the contribution of past actions to the cumulative effects of the proposed action existing conditions are used as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior actions that have affected access and might contribute to cumulative effects.

As noted in the “Existing Condition” section the condition of cultural properties on the IPNF is on a general downward trend. This trend is due to sites missed during cultural resource inventories, improperly implemented projects, public use and vandalism, and environmental factors, such as natural weathering, fire, flooding, and erosion. Given a known population of over 2,500 sites and the potential of finding as many as 25,000 more sites the trend will continue downward. Sites that were recorded in the late seventies and during the 1980s can no longer be found, especially American Indian, mining, logging, and trail sites and associated historic districts and landscapes. Sites are being lost continuously and at some point in the future, possibly within the lifespan of this document, some sites, site types, historic districts, and historic landscapes will disappear completely.

American Indian Rights and Interests

Introduction

Federal agencies have trust responsibilities to American Indian Tribes under treaty (Treaty Tribes) and in compliance with various laws and executive orders. Within the boundaries of the IPNF there are two tribes with Treaty reserved, off-reservation rights: the Kootenai Tribe of Idaho and the Confederated Salish and Kootenai Tribes. In addition, the Coeur d′Alene Tribe of Idaho has reserved rights through executive order on a limited section of the Coeur d′Alene River Ranger District. Federal guidance for tribal consultation directs the Forest Service to increase and improve the involvement of tribes in the decision-making process in the areas where decisions affect tribes and their treaty rights and interests. There is a trust responsibility in regard to managing the resources on which the Treaties are based. The Nez Perce Tribe has a wide ranging aboriginal territory that coincides with the general location of the Coeur d′Alene Tribal lands within the IPNF, but off reservation rights associated with ceded lands under the Stevens Treaty of 1855 are located to the south of the Forest boundary. Both the Spokane and the Colville Tribal territories lay within Washington, to the west of the Forest boundary, but both visited the environs of the IPNF during the historic and prehistoric periods. The Forest is also required to consult with all federally-recognized tribes that had/have traditional uses within the forest boundary. This consultation extends to the Kootenai Tribe of Idaho, the Kalispel Tribe of Indians, the Coeur d′Alene Tribe of Idaho, the Confederated Salish and Kootenai Tribes, the Spokane Tribe of Indians, the Confederated Tribes of the Colville Reservation, and the Nez Perce Tribe.

Legal and Administrative Framework

Law and Executive Orders

- **The Hellgate Treaty of 1855:** The Flathead, Kootenai, and Upper Pend d'Oreilles Indian Tribes reserved rights under the Hellgate Treaty of 1855 (July 16, 1855). These rights include the "right of taking fish at all usual and accustomed places, in common with citizens of the Territory, and of erecting temporary buildings for curing; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land.”

  According to “Tribal Interests in the Management of National Forest Lands A Partial Summary of Unique Tribal Rights and Interests in the Management of National Forests and Related Forest Service Authorities and Responsibilities” a January 2, 2009 draft by Tribal Relations Specialist R1/R4 by Dale Kanen (Kanen 2009) the Kootenai Tribe of Idaho (Bonners Ferry Kootenai) is also considered to be an unnamed party to the 1855 Hellgate Treaty (see State v. Coffee, 97 Idaho 905, 556 P.2d 1185 and Indian Claims Commission’s (ICC) finding in Kootenai Tribe or Band of Indians of the state of Idaho v. United States). The ICC found that the Senate ratification of the Hellgate Treaty also effectively extinguished the Idaho Kootenai’s aboriginal right to occupy the Kootenai River drainage and they, along with signatory tribes, were left with a right to hunt on open and unclaimed land, among other rights enumerated under the Hellgate Treaty.

- **Treaties with the Nez Perce of 1855 and 1863:** In a draft of the document “Tribal Interests in the Management of National Forests” (1/2/2009) Dale Kanen, R1/R4 Tribal Relations Specialist described Coeur d’Alene Tribal off-reservation rights in the following manner:

- **"Treaty with the Nez Perce of 1855, Article 3:** "The exclusive right of taking fish in all the streams where running through or bordering said reservation is further secured to said Indians; as also the right of taking fish at all usual and accustomed places {11.6} in common with citizens of the Territory; and of erecting temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land.
- **Treaty with the Nez Perce of 1863, Article 8:** "The United States also agree to reserve all springs or fountains not adjacent to, or directly connected with, the streams or rivers within the lands hereby relinquished, and to keep back from settlement or entry so much of the surrounding land as may be necessary to prevent the said springs or fountains being enclosed; and further, to preserve a perpetual right of way to and from the same, as watering places, for the use in common of both whites and Indians."

- **Executive Orders of 1873 and 1889 with the Coeur d'Alene Tribe:** In 1873 the Coeur d'Alene Tribe was granted a reservation by the executive order of President Grant that was amended in 1879 to clarify compensation for their ceded lands. In 1887 John V. Wright, Jared W. Daniels, and Henry W. Andrews, Commissioners of the United States, met with the Coeur d'Alene Indians at which time Chief Andrew Seltice signed an agreement outlining compensation for loss of their lands ceded in 1873. In the same agreement the "Upper and middle bands of Spokane Indians residing in and around Spokane Falls…[and]…the Calespels, now residing in the Calespel Valley, Washington Territory, and any other bands of non-reservation Indians now belonging to the Colville Indian Agency, may be removed to the Coeur d'Alene Reservation by the United States" (Executive Order of 1889). In compensation for ceding lands in Idaho, Washington, and Montana territories the tribes were promised that the reservation land would belong to the Tribe, they would be given cash payments, provided preference in certain occupations performed on the reservation, and those certain essential occupations would be paid for by the United States Government. No reserve rights under the executive order outside of the established reservation were provided. In 1889, Commissioners Benjamin Simpson, John H. Shupe, and Napoleon B. Humphrey negotiated an amendment to the 1887 agreement for ceding additional lands within the reservation in lieu of cash payments to the members of the Tribe then living on the reservation.

  However, in a draft of the document "Tribal Interests in the Management of National Forests" (1/2/2009) Dale Kanen, R1/R4 Tribal Relations Specialist described Coeur d'Alene Tribal off-reservation rights in the following manner:

  > "The Coeur d'Alene appears to have retained hunting, fishing, trapping, gathering, and grazing rights on a portion of the IPNF that is within the original 1873 reservation. The exterior boundaries of the current reservation are smaller than the original 1873 reservation boundary (Idaho v. U.S., 2001). Rights to hunt, fish, trap, graze, etc., on lands within the original 1873 reservation were never explicitly extinguished in any subsequent agreements that I could find {252}. Therefore they exist {38}. Article 2 of an 1889 Agreement does say:
  >
  > > For the consideration hereinafter stated the said Coeur d'Alene Indians hereby cede, grant, relinquish, and quitclaim to the United States all right, title, and claim which they now have, or ever had, to all lands in said Territories and elsewhere, except the portion of land within the boundaries of their present reservation in the Territory of Idaho, known as the Coeur d'Alene Reservation.

> But courts have been reluctant to read similar language as unambiguously extinguishing rights to harvest natural resources {36}. See also Leech Lake Band of Chippewa Indians v. Herbest (D.Minn. 1971). To avert litigation, a July 25, 1988, Agreement between the state of Idaho and the Tribe notes that the extent of tribal hunting and fishing rights is unsettled and stipulates some restrictions to Tribal harvests. (For similar reasons, portions of the Ashley NF in Region 4 that were once part of the Ute reservation may be encumbered with reserved rights)."

- **National Historic Preservation Act (NHPA) of 1966 (P.L. 89-665, as amended, P.L. 91-423, P.L. 94-422, P.L.94-458 and P.L. 96-515) Regulations 36 CFR Part 800 and 36 CFR 36 CFR Part 7:** This act pertains only to tangible properties (buildings, structures, sites, or objects) which are important in history and prehistory. It requires agencies to consider the effects of undertakings on properties eligible to or listed in the National Register of Historic Places by following the regulatory process specified in 36 CFR 800.

  The portions of that act that relate specifically to coordination with Indian Tribes were added in the 1992 amendments. These additions reflect the increased importance placed on Tribal relations. A section of the act directs state and federal governments to assist in the establishment of preservation programs on Indian lands. These sections include:

  - **Section 2:** It shall be the policy of the federal government, in cooperation with other nations and in partnership with the state, local governments, Indian Tribes, and private organizations and individuals to:
    - (2) Provide leadership in the preservation of the prehistoric and historic resources of the United States and of the international community of nations and in the administration of the national preservation program.
    - (6) Assist state and local governments, Indian Tribes and Native Hawaiian organizations and the National Trust for Historic Preservation in the United States to expand and accelerate their historic preservation programs and activities.
- **National Environmental Policy Act (NEPA) of 1969 (P.L .91-190) and Regulations 40 CFR 1500-1508:** Federal agencies began to invite Indian Tribes to participate in forest management projects and activities that may affect them.
- **National Forest Management Act (NFMA) of 1976 (P.L. 4-588):** Directs consultation and coordination of NFS planning with Indian Tribes.
- **American Indian Religious Freedom Act of 1978 (AIRFA) (P.L.95-341 as amended, P.L. 103-344):** AIRFA states that "...it shall be the policy of the United States to protect and preserve for American Indians their inherent right for freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to site, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites".

  Agencies must make a good faith effort to understand how Indian religious practices may come into conflict with other forest uses and consider any adverse impacts on these practices in their decision-making practices. The consideration of intangible, religious, ceremonial, or traditional cultural values and concerns which cannot be tied to specific cultural sites/properties could be considered under AIRFA.

- **Archaeological Resources Protection Act of 1979 (ARPA) (P.L. 96-95) and Regulations 43 CFR Part 7:** Establishes a permit process for the management of cultural sites on federal lands which provides for consultation with affected tribal governments.
- **Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (P.L. 101-601, 25 U.S.C. 3001-3013) and Regulations 43 CFR Part 10:** Addresses the rights of lineal descendants and members of Indian Tribes, Alaska Native, and native Hawaiian organizations to certain human remains and precisely defined cultural items. It covers items currently in federal repositories as well as future discoveries. The law requires federal agencies and museums to provide an inventory and summary of human remains and associated funerary objects. The law also provides for criminal penalties in the illegal trafficking in Native American human remains and cultural items.
- **Interior Secretarial Order 3175 of 1993:** Establishes responsibility of all agencies to carry out trust responsibilities of the federal government and assess the impacts of their actions on Indian trust resources. It requires consultation with tribes when impacts are identified.
- **Executive Order 12866 of 1993, Regulatory Planning and Review:** Enhances planning and coordination with respect to both new and existing regulations. Makes process more accessible and open to the public. Agencies shall seek views of tribal officials before imposing regulatory requirements that might affect them.
- **Religious Freedom Restoration Act of 1993 (P.L. 103-141):** Established a higher standard for justifying government actions that may impact religious liberties.
- **Executive Order 12898 of 1994, Environmental Justice in Minority Populations and Low-Income Populations:** Directs federal agencies to focus on the human health and environmental conditions in minority and low-income communities, especially in instances where decisions may adversely impact these populations.
- **Forest Service Tribal Relations Enhancement Act of 2006:**
    - **Reburial of Human Remains and Cultural Items:** The Native American Graves Protection and Repatriation Act provide for repatriation of human remains and cultural items to lineal descendants and Indian Tribes but does not address further disposition of these items. New authority would explicitly authorize the reburial of human remains and associated cultural items on NFS lands, when they were originally recovered from NFS or adjacent lands.
    - **Confidentiality of Information:** An increased level of confidentiality would be authorized to protect information relating to reburials, sites, or resources of traditional or cultural importance, including human remains and information relating to traditional and cultural resources and practices provided in the course of research activities.
    - **Forest Products for Traditional and Cultural Purposes:** American Indian and Alaska Native Tribes have special cultural and traditional needs for forest products located on NFS lands, such as logs and planks for cultural structures. The legislative proposal would create an exception to a NFMA requirement to sell certain forest products by authorizing the Secretary to provide these products free of charge, when used for traditional and cultural purposes.
    - **Access to National Forest System Lands:** The legislative proposal would reinforce the Forest Service's commitment to the American Indian Religious Freedom Act for access to NFS lands.
- **Executive Order 13007 of 1996, Indian Sacred Sites:** This order acknowledges the role of federal agencies to protect and preserve the religious practices and places of federally-recognized tribes and enrolled tribal members. It also requires agencies to consult with

federally-recognized tribe to address tribal concerns for sacred sites on public land and to ensure access to religious places and avoidance of adverse effects to sacred sites in accordance with existing legislation.

- **Executive Order 13175 of 2000, Consultation and Coordination with Indian Tribal Governments:** Provides direction for consultation with Tribal Governments for formulating or implementing policies that have tribal implications. Also provides direction regarding consultation and coordination with Indian Tribes relative to fee waivers. Calls upon agencies to use a flexible policy with tribes in cases where proposed waivers are consistent with applicable federal policy objectives. It directs agencies to grant waivers in areas where the agency has the discretion to do so, when a tribal government makes a request. When a request is denied, the agency must respond to the tribe in writing with the rationale for denial[1].
- **Executive 13084 of 1998, Consultation and Coordination with Indian Tribes Governments:** Calls upon agencies to utilize flexible policy approaches at the Indian tribal level in cases when a proposed waiver is consistent with applicable federal policy objectives. The E.O. calls upon agencies to grant waivers in areas where the agency has discretion to do so. This is to be done when a tribal government makes a request; and for those instances where the agency may decline such a request, a reason must be supplied to the tribe.

Code of Federal Regulations (CFR)

- **36 CFR 261 Prohibitions in Areas Designated by Order:** Closure of NFS Lands to Protect Privacy of Tribal Activities (2011) – "provides regulations regarding special closures to provide for closure of NFS lands to protect the privacy of tribal activities for traditional and cultural purposes…to ensure access to NFS land, to the maximum extent practicable, by Indian and Indian Tribes for traditional and cultural purposes".
- **36 CFR 223.239 and .240 Sale and Disposal of National Forest System Timber, Special Forest Products, and Forest Botanical Products:** Section 223.239 provides regulations for free-use without a permit for members of tribes with treaty or other reserved rights related to special forest products. Also free-use without a permit upon the request of the governing body of a Tribe. Section 223.240 provides regulations regarding harvest of special forest products by tribes with treaty or other reserved rights.

Key Indicators

- Tribal Rights and Interests;

[1] Section 2 of this Executive Order states "In formulating or implementing policies that have tribal implications, agencies shall be guided by the following fundamental principles:

•The United States has a unique legal relationship with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, Executive Orders, and court decisions. Since the formation of the Union, the United States has recognized Indian tribes as domestic dependent nations under its protection. The Federal Government has enacted numerous statutes and promulgated numerous regulations that establish and define a trust relationship with the United States.

•Our Nation, under the law of the United States, in accordance with treaties, statutes, Executive Orders, and judicial decisions, has recognized the right of Indian Tribes to self-government. As domestic dependent nations, Indian Tribes exercise inherent sovereign powers over their members and territory. The United States continues to work with Indian Tribes on a government-to-government basis to address issues concerning Indian tribal self-government, tribal trust resources, and Indian treaty and other rights.

•The United States recognizes the right of Indian Tribes to self-government and supports tribal sovereignty and self-determination."

- Access;
- Places; and
- Resource Usability.

Methodology and Analysis Process

There are four key indicators used to assess the extent that each alternative responds to federal trust responsibilities and tribal rights and interests. “Tribal rights and interests” were measured by relatively ranking of each alternative’s objectives and standards for effectiveness of response. “Access” was measured using the theme of each alternative and road/trail management objectives and standards. “Places” were measured by relatively ranking alternative objectives and standards for access and management of significant locations for the tribe. “Resource usability” was measured by a relative ranking of each alternative based on biophysical trends and tribal interest species habitat trends. Together these give an overview of the major concerns and relative means of ranking alternatives.

For the discussion on individual MAs and alternatives for each Tribe ESRI ARC Map GIS software was used to determine the acreages for each MA by alternative using the aboriginal and ceded lands boundaries shown in figure 43. The aboriginal territory and ceded land boundaries were compiled from Treaty/Executive Order language and compared to those provided to the Forest by the Coeur d’Alene Tribe for their aboriginal territory. For each alternative the MAs that intersected Tribal aboriginal territory or ceded lands were selected out and exported to a new layer. Acreages for each MA were totaled from the appropriate layer table and entered into a Microsoft Excel spreadsheet to complete individual tables and charts in this document.

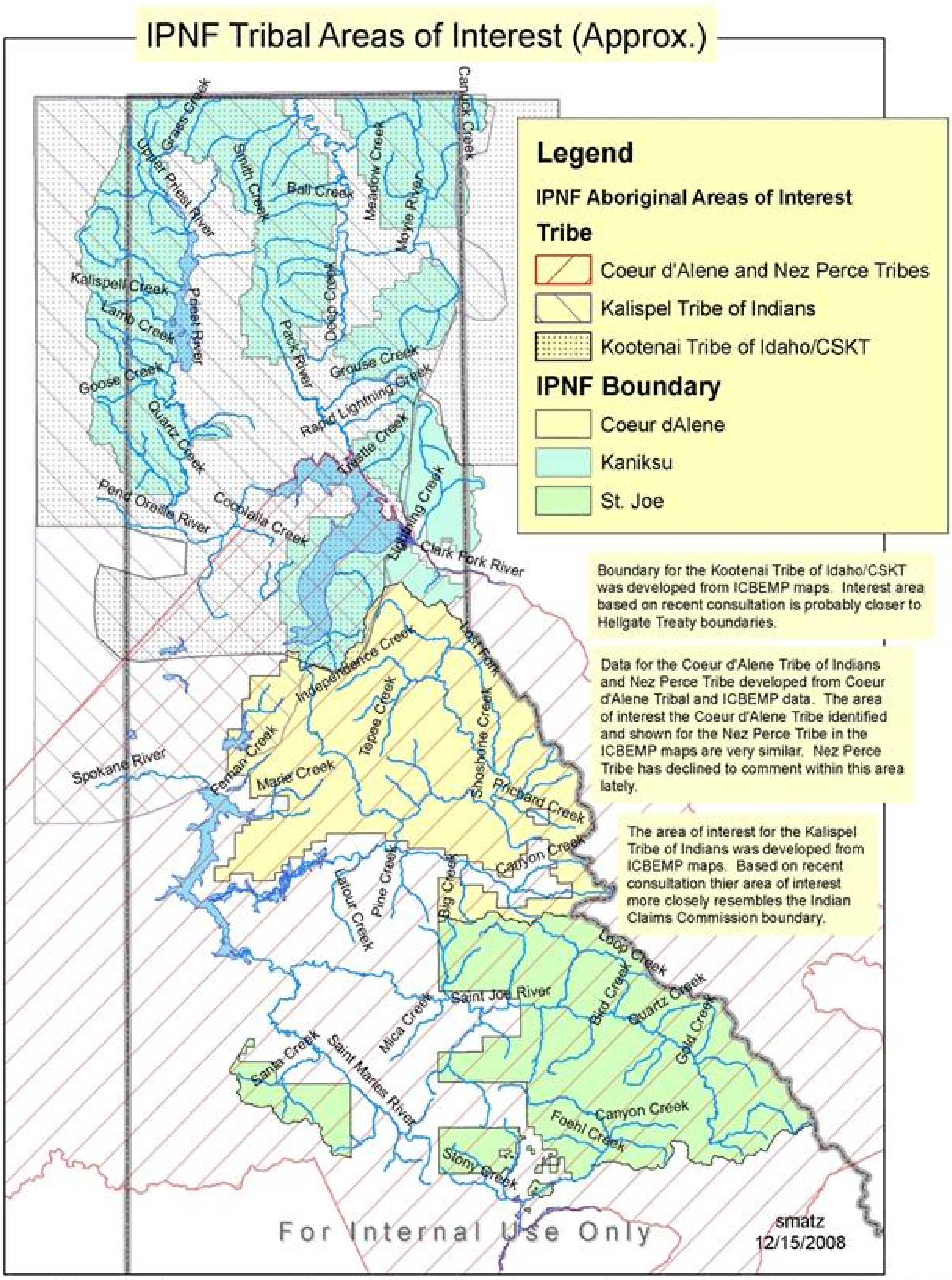
Affected Environment (Existing Condition)

There are seven federally-recognized American Indian nations affiliated with lands managed by the IPNF: the Kootenai Tribe of Idaho, the Kalispel Tribe of Indians, the Coeur d′Alene Tribe, the Spokane Tribe, Nez Perce Tribe, the Confederated Tribes of the Colville Reservation, and the Confederated Salish and Kootenai Tribes. Of those, the Kootenai Tribe of Idaho, Spokane Tribe, Kalispel Tribe of Indians, and the Coeur d′Alene Tribe have taken part in formal and informal discussions regarding forest and individual project planning. Forest Service administered lands today occupies lands that were in traditional aboriginal territory (figure 43). The aboriginal territory of the Nez Perce, Coeur d′Alene, and Spokane Tribes tend to overlap on the St. Joe and Coeur d′Alene Ranger Districts. The Kalispel Tribe of Indians aboriginal territory takes in portions of the Priest Lake and Sandpoint Ranger Districts, overlapping with the Coeur d′Alene and Spokane Tribal territory along the Pend Oreille and lower Clark Fork Rivers and use of the major lakes. The Kootenai Tribe of Idaho’s aboriginal territory takes in the Bonners Ferry, Priest Lake, and Sandpoint Ranger Districts and use of the IPNF major lakes and the lower Clark Fork River valley. The Confederated Tribes of the Colville Reservation may have utilized the Priest Lake area for hunting and gathering. The Confederated Salish and Kootenai Tribes have expressed interest in the lower Clark Fork River and Lake Pend Oreille.

Ethnographic records provide extensive documentation for the past aboriginal use of the Forest. There remains a poignant connection for American Indian Tribes between traditional and contemporary uses on their original aboriginal lands. Tribes continue to rely on ecosystems even as their cultures change, employing both traditional and contemporary ways of relating to their homelands and lands where they traditionally ranged to sustain their way of life. Lands within the IPNF help to sustain a way of life, cultural integrity, social cohesion, and economic well-being for tribes.

The IPNF takes an active role on the tribes' behalf, especially in areas of treaty interest, rights, traditional/cultural resources, and ecosystem integrity, by maintaining opportunities for traditional American Indian land and resource use. The presence of healthy habitats is fundamental to the achievement of both usable and harvestable levels of resources significant to American Indians, as well as to ecosystem integrity.

Four of the tribes have off reservation rights under Treaty or Executive Order: the Nez Perce (Treaties of 1855 and 1863), the Coeur d′Alene (Executive Order), Confederated Salish and Kootenai Tribes and the Kootenai Tribe of Idaho (Hellgate Treaty of 1855; July 16, 1855). According to Kanen (2009) the Kootenai Tribe of Idaho (Bonners Ferry Kootenai) is also considered to be an unnamed party to the 1855 Hellgate Treaty (see State v. Coffee, 97 Idaho 905, 556 P.2d 1185 and Indian Claims Commission's (ICC) finding in Kootenai Tribe or Band of Indians of the state of Idaho v. United States). The ICC found that the Senate ratification of the Hellgate Treaty also effectively extinguished the Idaho Kootenai aboriginal right to occupy the Kootenai River drainage and they, along with signatory tribes, were left with a right to hunt on open and unclaimed land. These rights include the "right of taking fish at all usual and accustomed places in common with citizens of the Territory, and of erecting temporary buildings for curing; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land." The Nez Perce Tribe has the right under the Treaties of 1855 and 1863 of "taking fish at all usual and accustomed places in common with citizens of the Territory; and of erecting temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land." The treaty also requires that all springs or fountains outside of relinquished lands be kept open for access to both natives and whites. The Coeur d'Alene appear to have retained hunting, fishing, trapping, gathering, and grazing rights on a portion of the IPNF that is within the original 1873 reservation (figure 44).



This map is for informational purposes only. The boundaries portrayed are approximate and should only be used to determine general areas of tribal interest. Consultation with individual tribes is necessary to determine actual areas of interest. For the Kootenai Tribe of Idaho the Hellgate Treaty languate should be reviewed for boundaries to determine treaty rights. For the Coeur d'Alene and Kalispel Tribes Executive Order language should be consulted for boundary information and rights.

Figure 43. Aboriginal Territories of the IPNF

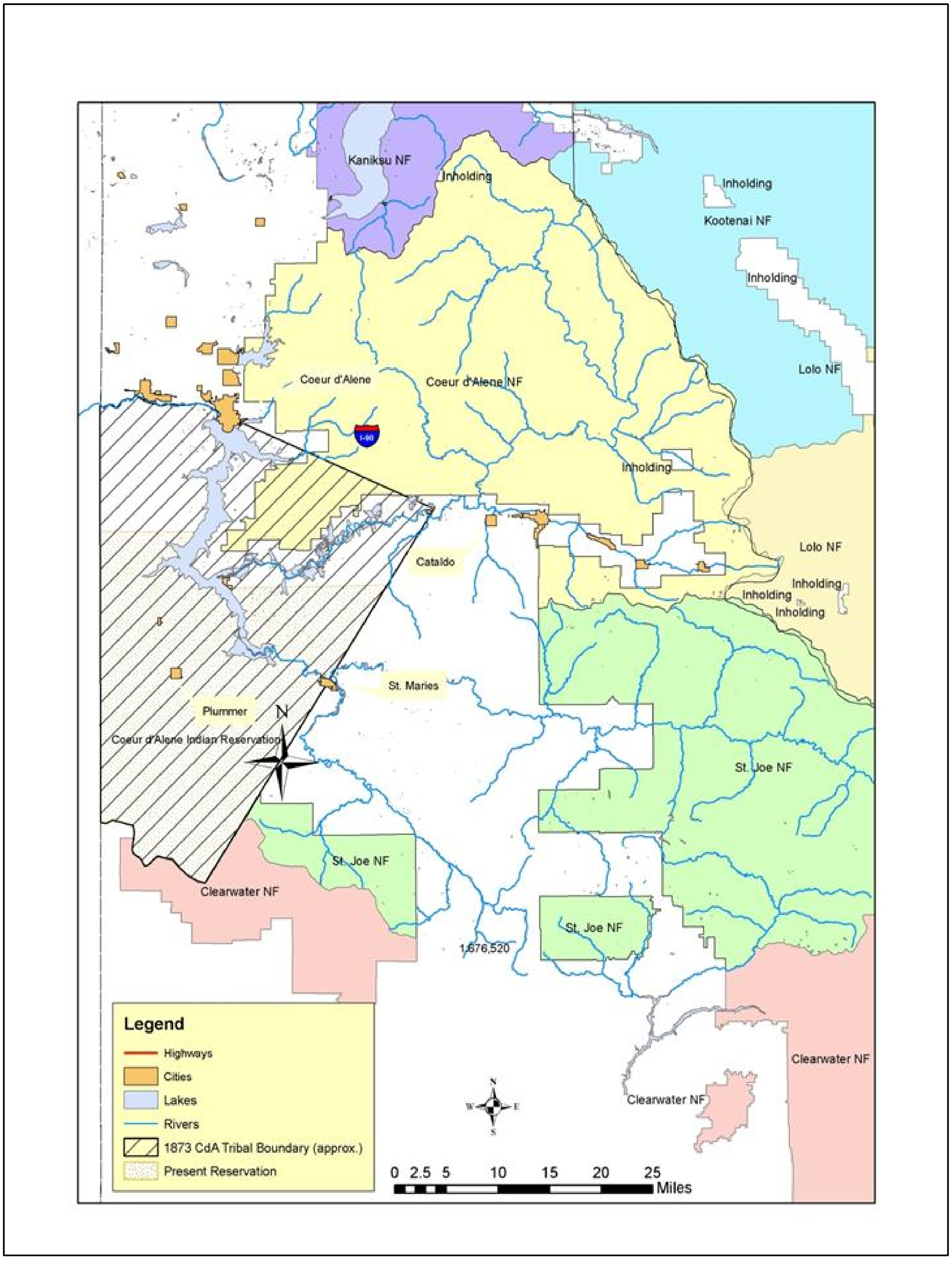


Figure 44. Coeur d'Alene ceded lands on IPNF. The area of the 1873 reservation boundary that overlaps with the Coeur d'Alene Ranger District managed lands is considered to have reserved off reservation rights attached that were not extinguished under the Executive Order that reduced the size of the reservation

The federal government has trust responsibilities to tribes under a government-to-government relationship to ensure that the Tribes reserved rights are protected. Consultation with the tribes in early phases of project planning helps the Forest Service meet their trust responsibilities. The IPNF has been meeting these treaty responsibilities by designating a forestwide Tribal Relations Coordinator and having line officers who are assigned a tribe for purposes of government-to-government consultation. The Tribal Relations Coordinator is informed of planned projects on the Forest and coordinates with the line officer regarding forestwide initiatives and National Indian policy, regulations, and laws. At this time the St. Joe District Ranger coordinates with the Coeur d'Alene Tribe of Idaho, the Priest Lake District Ranger with the Kalispel Tribe of Indians, and the Bonners Ferry District Ranger with the Kootenai Tribe of Idaho. Coordination and consultation with the Confederated Salish and Kootenai is handled by the KNF. The Nez Perce Tribe, Confederated Tribes of the Colville Reservation, and Spokane Tribe or Indians has declined to consult with the IPNF; however, they are sent Forest Planning and project planning notices. The line officer and their staff consults appropriate tribal departments and Tribal Councils, as well as with members of the Tribe to identify issues. Issues are discussed with the line officers, who take tribal responses into consideration in making management decisions.

Consultation on Forest Plan revision began with the seven tribes in 2002. The IPNF covered consultation with the Kootenai Tribe of Idaho, the Kalispel Tribe, the Coeur d′Alene Tribe, the Confederated Tribes of the Colville Reservation, the Nez Perce Tribe, and the Spokane Tribe of Indians as the bulk of aboriginal land for these four tribes are on that Forest. The KNF's consultation focused on consultation with the Confederated Salish and Kootenai Tribes. Through that process the Confederated Salish and Kootenai Tribes identified 23 Special Interest Areas on the KNF, while the remaining Tribes declined to identify the similar areas that exist on the IPNF. These areas are associated with the traditional beliefs of the Tribe in relation to its origins, cultural history, or the nature of the world; where tribes have historically gone, and are known to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice; where an American Indian community has traditionally carried out economic, artistic, or other cultural practices important in maintaining their identity.

Environmental Consequences

General Effects

The three tribes that have participated in Forest Plan revision will be discussed in detail: The Coeur d′Alene Tribe of Idaho, the Kootenai Tribe of Idaho, and the Kalispel Tribe of Indians. While the Nez Perce Tribe has off reservation treaty rights within the IPNF, they have not responded to repeated attempts to take part in consultation with the Forest regarding planning issues, nor have the Confederated Tribes of the Colville Reservation or the Spokane Tribe of Indians opted to participate in forest plan revision. The Confederated Salish and Kootenai Tribes have off reservation rights on the IPNF, but have generally let the Kootenai Tribe of Idaho handle consultation on the IPNF, while they have concentrated on consultation regarding the KNF Forest Planning effort. Even though the other tribes are not considered in detail, this analysis of effects should be relatively similar for all of the tribes, except that each has its own unique relationship to MAs within their ceded lands or aboriginal territories for each alternative.

Tribal Rights and Interests

Each of the three tribes has slightly different rights according to treaty, Executive Order and various laws, regulations, and court orders. According to Kanen (2009) the Kootenai Tribe of Idaho (Bonners Ferry Kootenai) is considered to be an unnamed party to the 1855 Hellgate

Treaty (see State v. Coffee, 97 Idaho 905, 556 P.2d 1185 and Indian Claims Commission's finding in Kootenai Tribe or Band of Indians of the state of Idaho v. United States). The Indian Claims Commission found that the Senate ratification of the Hellgate Treaty effectively extinguished the Idaho Kootenai's aboriginal right to occupy the Kootenai River drainage. Therefore, they along with signatory tribes, were left with a right to hunt on open and unclaimed land. These rights include the "right of taking fish at all usual and accustomed places, in common with citizens of the Territory, and of erecting temporary buildings for curing; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land." The Coeur d′Alene have retained hunting, fishing, trapping, gathering, and grazing rights on a portion of the IPNF that is within the original 1873 reservation (figure 44). The Kalispel Tribe of Indians has no reserved rights under treaty; however, as with the Coeur d′Alene Tribe they do claim access and use of resources as a federally recognized tribe across portions of the Forest. Both the Kootenai Tribe of Idaho and Coeur d′Alene Tribe mentioned concern over Native American human remains under NAGPRA. While none are known to be in the collections of the IPNF, Native American human remains may be found in certain areas of the Forest due to the large number of Indians who died during the early epidemics and were buried where they lay. While the Forest Service needs to be cognizant of consultation and management responsibilities across the IPNF in areas where the tribes retain treaty or ceded rights, special attention to Tribe's rights and interests within these areas have been recognized in the treaty or executive order.

Access

Access to traditional resources and sacred sites is a concern of all the tribes. While traditionally they may have reached these places by foot or horseback, today, motorized vehicles are essential for reaching these locations, especially for elders who can no longer walk long distances. Therefore, maintaining access to these areas is essential and consideration of motorized access for tribal members should be accommodated where ever possible. Those alternatives with the least motorized access would cause the greatest effect to tribal access even though lack of access may preserve and protect tribal resources from use and vandalism by non-tribal members.

One of the issues that have been identified by the tribes as a concern is size of areas that restrict motorized access (MA1a, 1b, 1c, 1e, and 2a). Alternative A has the least restrictions followed by Alternatives D, B Modified, and C respectively.

Places

Three types of places have importance to the tribes: 1) Locations of traditional resources; 2) sacred places; and 3) American Indian related cultural resources. With the exception of archaeological sites documented by the Forest Service, the locations of these places are generally held tightly by the tribes. When they are revealed they are usually provided with the caveat that the location be protected from public disclosure under the provisions of the NHPA, Archaeological Resources Protection Act, and provisions of the Farm Bill. However, in general, it can be said that locations near water, major travel corridors, and high elevation ridges and mountains have special significance to the tribes.

Management area objectives and standards that allow for disturbance of sacred and archaeological sites or uses in conflict with aboriginal resource and sacred practices may cause significant issues. Management areas allowing for high levels of ground disturbance may affect human remains that are found throughout the area due to historic epidemics. Those who died during the epidemics were buried where they died, but especially near village and fishing sites.

Resource Usability

Biophysical and tribal-interest species habitat trends can have significant effects to tribal resource use. Considering the effects of each alternative on these resources can help determine which alternatives have the least effects. Species of special interest mentioned during Forest Plan and project consultation include berries and firewood gathering. Many of the big game, upland and migratory bird, and aquatic species of concern to the tribes are the same ones in which the Forest Plan provides direction for protection. Specific management activities are analyzed during NEPA analysis of the effects and effects are generally mitigated through BMPs in other highly managed MAs.

Effects by Significant Issue

While a summary of effects by significant issue is provided below; for a more thorough discussion of the topic the reader is referred to the specific section in this FEIS.

Effects from Vegetation Management

Looking at the overall direction for MAs by alternatives can provide a relative guide to effects to tribal resources, sacred sites, and cultural properties. Vegetation management may cause both beneficial and harmful effects to traditional uses, sacred sites, and cultural properties of interest to the tribes. Depending on the habitat type and management action, specific species of interest to the tribes will fall into one of three categories: 1) on an upward trend; 2) no change in trend; and 3) on a downward trend. For use of traditional resources the differences between alternatives are so complex that they can only be discussed in relative terms; while use and management of sacred sites and cultural properties may be discussed in more specific terms if their location and description are known to the Forest Service.

In summary, it appears that Alternative B Modified may provide the best compromise between active and natural restoration activities for traditional resources, although, Alternative C has more concentration on natural vegetation succession patterns (see sections on wildlife, aquatics, and botany for additional analysis). Depending on the types of traditional resources, and whether mechanical treatment or natural succession is the better route, these two alternatives provide the best practices for upward trends for native resources of concern.

The locations of so few sacred sites are known that it is difficult to argue for differences in effect between alternatives. The tribes will have to evaluate impacts from the alternatives on their own since they do not share this information with the IPNF.

For cultural properties (see “Cultural Resources” section for more detail) there is not a significant amount of difference between alternatives, because depending on where treatable acres are located in each alternative the difference may be irrelevant.

Effects from Wildlife Management

For many thousands of years the tribes used wildlife for sustenance, clothing and tools, and for religious articles; a tradition that in one way or the other survives today. Both the Kootenai Tribe of Idaho and Coeur d’Alene Tribe have reserved rights to hunt parts of the IPNF, while the Kalispel Tribe of Indians are able to take game from their aboriginal territory for traditional practices and sustenance under law and regulation. While the Forest Service does not manage wildlife, it does manage the access and biological habitats that effect wildlife numbers and longer term viability. As such, overall management objectives of the habitat are of concern to the tribes. Depending on the habitat type and management action, specific species of interest to the tribes will fall into one of three categories: 1) on an upward trend; 2) no change in trend; and 3) on a downward trend. For use of traditional resources the differences between alternatives are so complex that they should be discussed in relative terms, while the effects of each alternative on wildlife habitats may be discussed in more specific terms. Additional information and analysis may be found in the respective sections of this EIS and specialist reports.

In summary, Alternative B Modified allows for the greatest ability to restore ecosystems that are out of desired conditions with respect to wildlife. The no-action alternative does not provide adequate direction and breaks up habitats more than other alternatives. While Alternative C provides more undisturbed land for protection of wildlife, it does not allow active restoration to the extent that Alternative B Modified does, leaving natural processes on their own to bring habitats back to desired condition. While Alternative D provides more potential for active restoration, it has the most disturbances and least emphasis on security habitat essential for some species.

Effects from Aquatic Management

High quality water is essential for aquatic resources used by the tribes for many thousands of years and is central to the circle of life. Both the Kootenai Tribe of Idaho and Coeur d'Alene Tribe have reserved rights to take aquatic resources on the IPNF, while the Kalispel Tribe of Indians are able to take aquatic resources from their aboriginal territory for traditional practices and sustenance under law and regulation. While the Forest Service does not manage "fisheries," they do manage the access and biological habitats and disturbances that effect water quality and longer term viability of aquatic species, and so overall management of the water quality and aquatic habitat management is of concern to the tribes. Depending on the aquatic resource, watershed health, and management action, specific species of interest to the tribes will fall into one of three categories: 1) on an upward trend; 2) no change in trend; and 3) on a downward trend. For use of traditional resources the differences between alternatives are so complex that they should be discussed in relative terms, while use and management of water quality and aquatic habitat may be discussed in more specific terms. Additional information and analysis may be found in the respective sections of this EIS and specialist reports.

In summary, Alternative C has the highest potential for passive restoration of ecosystems that are out of desired conditions with respect to aquatic resources, while Alternative B Modified allows slightly less passive restoration outside of MA6. While the no-action alternative would allow a continued upward trend in water quality and passive restoration over previous years it does not have as great a potential for passive restoration. Alternative D provides the most disturbances and least potential for passive restoration.

Effects from Recreation Management and Road Access

Recreation and road access are significant issues to the tribes. Recreation sites, both developed and dispersed, overlay archaeological and resource use sites. High density recreation, especially, tends to indirectly reduce Tribal use given conflicts between traditional uses and modern recreation activities. Since there is no difference in any of the alternatives for developed recreation sites this is not an issue that can be effectively analyzed within the confines of the Forest Plan document. Dispersed use, especially camping and off road vehicle play areas, where they overlay traditional gathering or resource use areas may have significant impacts on the ability of traditional practitioners to access and gather resources. However, access is a significant issue to the tribes and to some extent is guaranteed under treaty, law, regulation, and policy. While younger tribal members may be able to reach resource areas on foot or by horseback, elderly practitioners require motorized access to effectively reach some areas for resource and religious uses.

Existing developed recreation sites are retained in all action alternatives, although there is some difference between alternatives with respect to dispersed recreation and access. Although alternatives make no decisions to remove or to create developed recreation sites, some MA prescriptions identify needs for improvements. Recreation site decisions will be made through site-specific NEPA analysis as necessary to implement the Forest Plan direction.

Since tribal members use some Forest Service recreation facilities and need access to certain areas it is difficult to analyze alternative trade-offs. Alternative A allows for continued road decommissioning and a large area of wilderness values with little access, but better wildlife and aquatic habitat quality. Alternative B Modified has similar levels of wilderness values, but emphasizes non-motorized use that may affect tribal elders' ability to access traditional and sacred areas. Alternative C has the most wilderness values as well as an emphasis on reduction of motorized use, but should provide for better resource habitat. Alternative D allows for the most motorized access, but also includes development of some dispersed recreation sites and the most disturbance to habitats. If the concern is access then Alternative D may be preferred over the other action alternatives; however, if seeking a balance between accesses, increasing dispersed recreation conflicts, and an upward trending resource base, Alternative B Modified is preferred.

Effects from Fire and Fuels Management

Fire and fuels management may lead to loss of some species of interest, while benefitting others, as well as affecting access and the remains of sacred and archaeological sites of importance to the tribes. The effects of fire on major species are well known; however, there has been little study of more obscure resources. Therefore, the only way to analyze effects is to look at major habitats. It is also important, when planning for the potential use of natural, unplanned ignitions to meet resource objectives that the timing in relation to tribal resource use and sacred traditions is taken into account.

Again, depending on the resource or sacred use, it is difficult to analyze for effects numerically and so a relatively ranking based on qualitative factors is the only practical analysis to determine effects from fire and fuels management. With the move toward managing natural, unplanned ignitions to meet resource objectives, MAs will be analyzed for specific effects. However, if considered in the larger context of the Forest Plan a return to a more natural fire regime could be considered preferable to the tribes; depending on the resources, Tribal use, and timing. Alternative A does not provide the flexibility to manage large landscapes with natural, unplanned ignitions to meet resource objectives, while Alternatives B Modified and C focus on the use of natural, unplanned ignitions to meet resource objectives in the backcountry (MA5) and WUI. These alternatives seem preferable over the more intense management with fire and timber harvest described in Alternative D regarding Tribal concerns. As described earlier, the timing and location of the fire for resource benefits use should take into account necessary access for Tribal resource and sacred sites uses through appropriate consultation. Additional discussion on this topic can be found under the "Fire" sections of this document and in the specialist report.

Effects from Lands and Special Uses Management

All tribes object to loss of aboriginal lands through exchange or sale unless they provide access, opportunities, or resources equivalent or greater than those lost. At this time the IPNF has taken in more land than it has sold or exchanged out of, generally with significant benefits for Tribal access, resources, and the potential for bringing sacred sites back into the federal land base. Existing special uses do not vary by action alternative.

Summary by Tribe

MA Summary by Alternative for Coeur d'Alene Tribe

The aboriginal territory and ceded lands for the Coeur d'Alene Tribe are located mostly on the St. Joe and Coeur d'Alene Ranger Districts with a small section on the southern Sandpoint Ranger District. As seen in table 151 and figures 45 and 46 the majority of aboriginal lands consist of MA1, 4, 6, and 9 for the no-action alternative, while in the action alternatives aboriginal lands are mostly MA5 and 6.

The existing condition, or no-action alternative, consists of mostly mixed use lands and lands managed for big game species and primitive aspects. Under the no-action alternative about 73 percent of the Forest would be open for mixed use (MA1, 4, 6, and 19), while 29 percent would be managed for large game species (MA2, 3, 4, 5, and 6). About 25 percent of the aboriginal territory would be managed for its primitive aspects without significant road access (MA2, 3, 7, 9, 10, 11, 12, 13, and 20).

In the action alternatives, less aboriginal lands would be open to mixed use than the existing condition, with Backcountry and primitive type MAs making up the majority of the remaining MAs. In the action alternatives about 60 percent of the aboriginal territory would be managed for mixed use (MA6), with Alternative C having slightly less acreage than Alternative B Modified and D. Backcountry (MA5) allows for fire and some timber management to reduce fuels in the WUI. It is the second largest MA at 30 percent or less with Alternatives B Modified, D, and C having the highest to lowest percentage of acreage, but not by a significant difference. Areas that will preserve natural ecosystems (MA1a, 1b, 1c, 1e, 2a, and 2b), but will have little or no road access, make up from six to15 percent; with Alternatives B Modified and D being equal and Alternative C having the greatest acreage. Therefore, Alternative C has over twice the amount of primitive-type MAs, than the other two action alternatives. In Alternatives B Modified and D the Mallard Larkins are retained as a primitive area, while in Alternative C it is recommended as proposed wilderness.

Table 151. Management Area (MA) Acreage by Alternative for the Coeur d’Alene Tribe

Alternative A			Alternative B Modified			Alternative C		Alternative D	
MA	Acres	Percent Total	MA	Acres	Percent Total	Acres	Percent Total	Acres	Percent Total
MA1	873,889	45%	MA1a	0	0%	0	0%	0	0%
MA2	43,685	2%	MA1b	50,089	3%	19,5714	12%	50,089	3%
MA3	0	0%	MA1c	6,915	0%	6,915	0%	6,914	0%
MA4	234,785	12%	MA1e	0	0%	0	0%	0	0%
MA5	15,397	1%	MA2a	21,354	1%	21,354	1%	21,355	1%
MA6	263,365	14%	MA2b	38,285	2%	34,093	2%	38,298	2%
MA7	0	0%	MA3	25,464	2%	3,338	0%	25,464	2%
MA9	232,980	12%	MA4a	4,427	0%	4,427	0%	4,432	0%
MA10	66,476	3%	MA4b	3,134	0%	3,184	0%	3,182	0%
MA11	76,279	4%	MA5	467,258	30%	394,953	25%	434,552	28%
MA12	23,107	1%	MA6	942,643	60%	895,638	57%	975,320	62%
MA13	501	0%	MA7	7,674	0%	7,674	0%	7,676	0%
MA14	6,153	0%							
MA17	954	0%							
MA18	606	0%							
MA19	30,856	2%							
MA20	65,830	3%							
Total	**1,934,863**	**100%**		**1,567,243**	**100%**	**1,567,290**	**100%**	**1,567,282**	**100%**

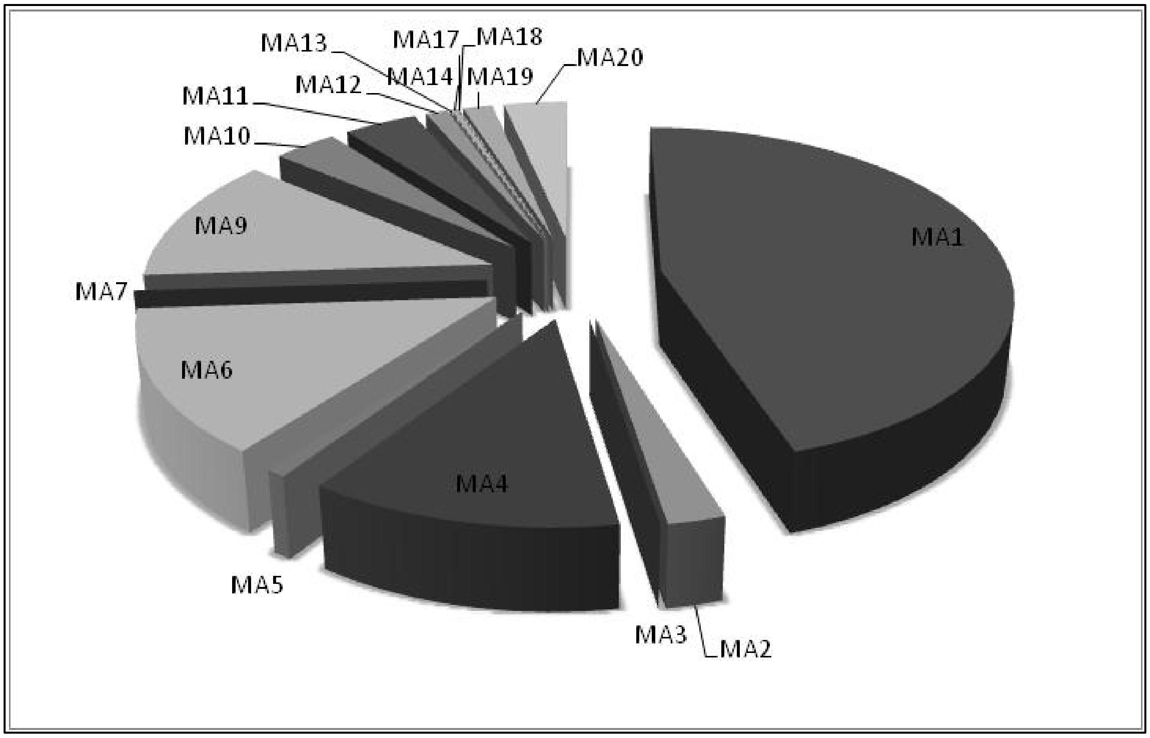


Figure 45. Relative amounts of each MA for the No-action alternative within the Coeur d'Alene Aboriginal Territory

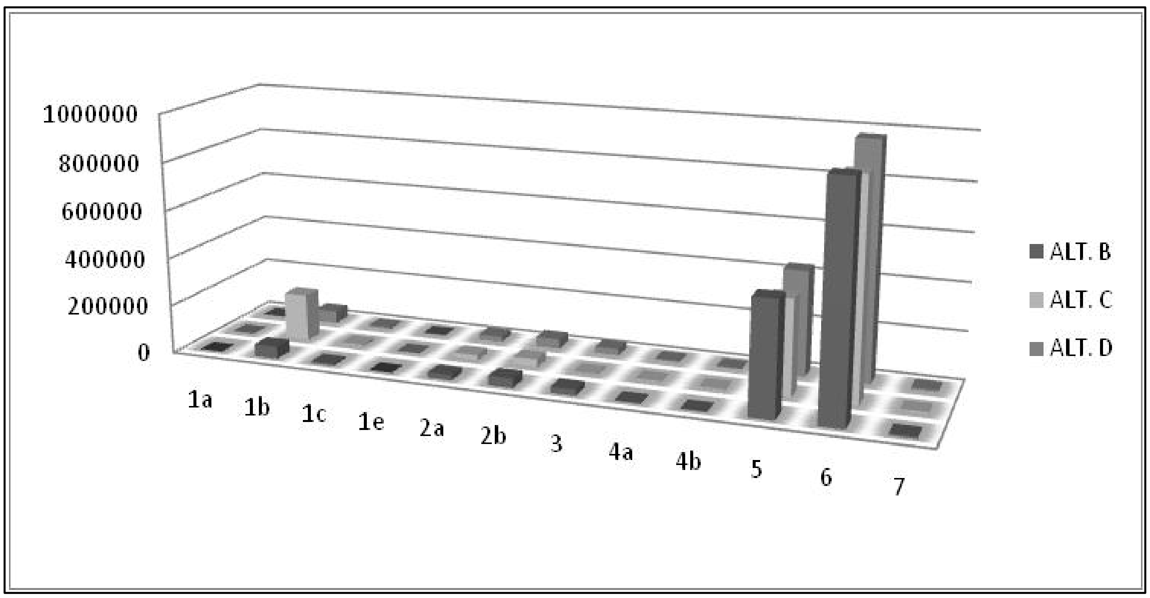


Figure 46. Relative Amounts of each MA for Action Alternatives within the Coeur d'Alene Aboriginal Territory

MA Summary by Alternative for Kalispel Tribe of Indians

The aboriginal territory and ceded lands for the Kalispel Tribe of Indians is located mostly on the eastern section of the Kaniksu National Forest in the Bonners Ferry, Priest Lake, and Sandpoint Ranger Districts. As seen in table 152 and figures 47 and 48 the majority of aboriginal lands consist of MA1, 2, 4, 7, and 9 for the no-action alternative, while the action alternatives are mostly MA5 and 6.

The existing condition or no-action alternative consists of mostly mixed use lands, lands managed for their primitive aspect, and finally, lands managed for big game species. Under the no-action alternative about 58 percent of the Forest would be open for mixed management (MA1, 4, 6, and 19), while 13 percent would be managed for large game species (MA2, 3, 4, 5, and 6). About 40 percent of the aboriginal territory would be managed for its primitive aspects with little or no road access (MA2, 3, 7, 9, 10, 11, 12, 13, and 20).

In the action alternatives there is significant difference between the alternatives with respect to mixed use, backcountry (MA5), and primitive lands (MA1e). In the action alternatives from 66 to 73 percent of the aboriginal territory would be managed for mixed use (MA6), while Alternative C has slightly less acreage than Alternative B Modified and D. Backcountry (MA5) allows for fire and some timber management to reduce fuels in the WUI and is the second largest MA with acreages totaling between 17 and 20 percent with Alternatives B Modified and C being equal in acreage and Alternative D having the highest acreage. Areas that will preserve natural ecosystems (MA1a, 1b, 1c, 1e, 2a, and 2b), but will have little or no road access, make up about 9 to 13 percent, with Alternatives B Modified and D being of equal size and Alternative C having the largest percentage.

Table 152. Management Area (MA) Acreage by Alternative for the Kalispel Tribe of Indians

Alternative A			Alternative B Modified			Alternative C		Alternative D	
MA	Acres	Percent Total	MA	Acres	Percent Total	Acres	Percent Total	Acres	Percent Total
MA1	740,131	44%	MA1a	9,887	1%	9,887	1%	9,888	1%
MA2	178,106	11%	MA1b	55,434	4%	133,027	10%	55,271	4%
MA3	15,738	1%	MA1c	0	0%	0	0%	0	0%
MA4	160,112	10%	MA1e	21,345	1%	0	0%	11,207	1%
MA5	0	0%	MA2a	0	0%	0	0%	0	0%
MA6	22,167	1%	MA2b	36,275	3%	22,493	2%	36,548	3%
MA7	137,905	8%	MA3	9,978	1%	9,878	1%	9,978	1%
MA9	234,660	14%	MA4a	8,359	1%	8,359	1%	8,356	1%
MA10	58,422	3%	MA4b	5,029	0%	5,029	0%	5,027	0%
MA11	55,534	3%	MA5	294,638	20%	282,906	20%	247,089	17%
MA12	6,099	0%	MA6	1,002,051	69%	914,417	66%	1,045,731	73%
MA13	6,607	0%	MA7	7,941	1%	7,941	1%	7,941	1%
MA14	12,375	1%							
MA17	2,126	0%							
MA18	671	0%							
MA19	50,643	3%							
MA20	0	0%							
Total	**1,681,296**	**100%**		**1,450,937**	**100%**	**1,393,937**	**100%**	**1,437,036**	**100%**

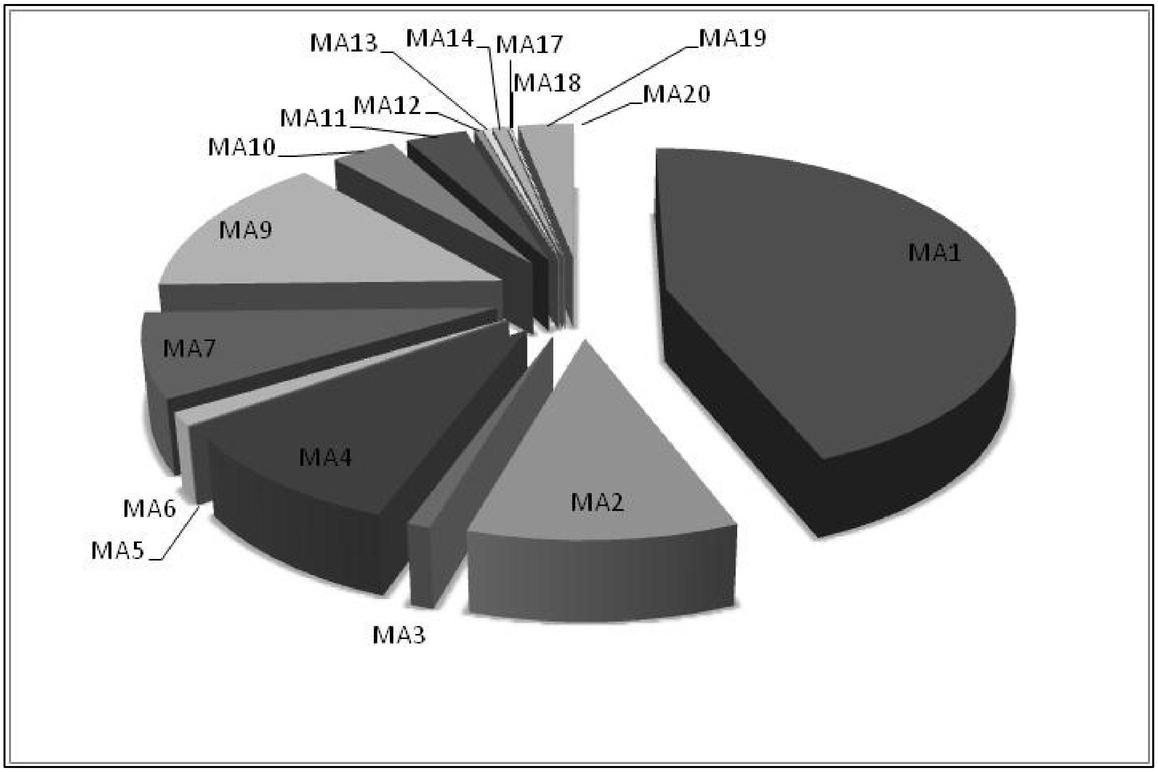


Figure 47. Relative comparison of MAs for the no-action alternative within the Kalispel Tribe of Indians Aboriginal Territory

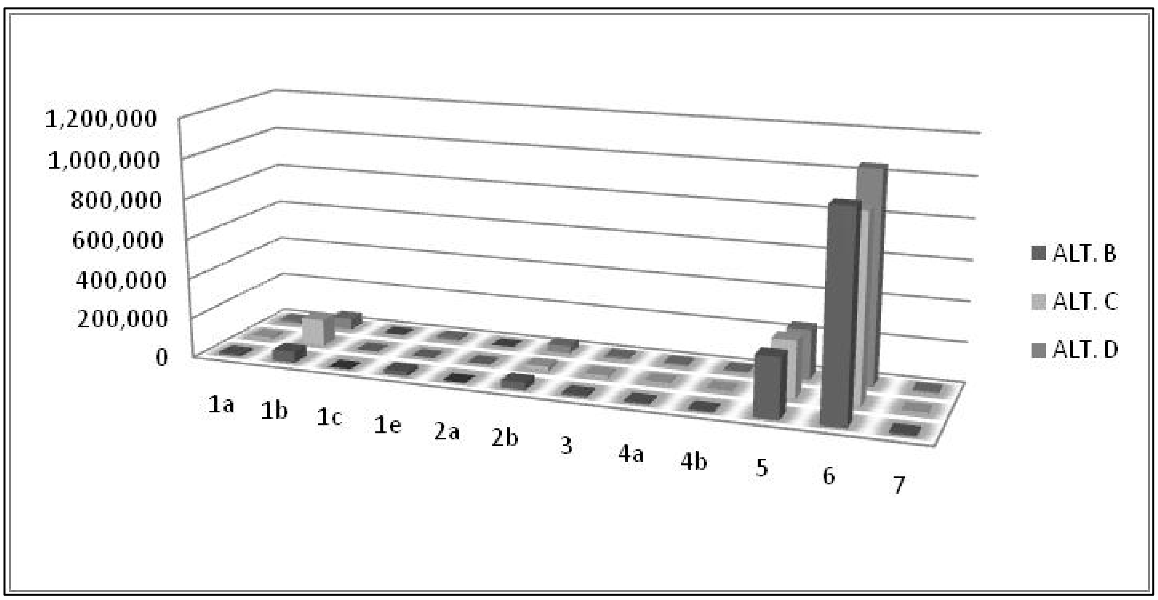


Figure 48. Relative Comparison of MA Acreages for Action Alternatives for the Kalispel Tribe of Indians Aboriginal Territory

MA Summary by Alternative for Kootenai Tribe of Idaho

The aboriginal territory and ceded lands for the Kootenai Tribe of Idaho is located mostly on the Priest Lake, Sandpoint and Bonners Ferry Ranger Districts, with a small section of the Coeur d'Alene Ranger District included on its west side along the Pend Oreille River. As seen in table

153 and figures 49 and 50 the majority of aboriginal lands consist of MAs 1, 2, 4, 7 and 9 for the no-action alternative, while the action alternatives are mostly MAs 5 and 6.

The existing condition, or no-action alternative, has the largest percentage of aboriginal lands under mixed management, with primitive lands contributing a significant percentage of the acreage. Under the no-action alternative about 56 percent of the Forest would be open for mixed management (MAs 1, 4, 6, and 19), while 21 percent would be managed for large game species (MAs 2, 3, 4, 5, and 6). About 42 percent of the aboriginal territory would be managed for its primitive aspects without road access (MAs 2, 3, 7, 9, 10, 11, 12, 13, and 20).

The action alternatives features almost 65 to 72 percent of aboriginal lands in the mixed management classification, with more than half of the remainder featured as backcountry and about 10 percent managed for its primitive aspects. In the action alternatives about 65 to 72 percent of the aboriginal territory would be managed for mixed management (MA6) with Alternative C, B Modified and D having the least to most acreage. Backcountry, MA5, allows for fire and some timber management to reduce fuels in the WUI and is the second largest MA. Alternatives D, C and B Modified have the highest to lowest percentage of acreage, at 21 to 17 percent. Areas that will preserve natural ecosystems (MAs 1a, 1b, 1c, 1e, 2a, and 2b), but will have little or no road access make up nine to 13 percent, with Alternatives B Modified and D being equal and Alternative C having the most acreage.

Table 153. Management Area (MA) Acreage by Alternative for the Kootenai Tribe of Idaho

Alternative A			Alternative B Modified			Alternative C		Alternative D	
MA	**Acres**	**Percent Total**	**MA**	**Acres**	**Percent Total**	**Acres**	**Percent Total**	**Acres**	**Percent Total**
MA1	738,701	44%	MA1a	9,887	1%	9,887	1%	9,888	1%
MA2	178,106	11%	MA1b	80,007	5%	157,600	11%	78,718	5%
MA3	15,738	1%	MA1c	0	0%	0	0%	0	0%
MA4	135,445	8%	MA1e	21,345	1%	0	0%	11,207	1%
MA5	0	0%	MA2a	0	0%	0	0%	0	0%
MA6	19,450	1%	MA2b	24,895	2%	11,113	1%	25,144	2%
MA7	137,905	8%	MA3	9,978	1%	9,878	1%	9,978	1%
MA9	223,599	13%	MA4a	8,359	1%	8,359	1%	8,356	1%
MA10	62,442	4%	MA4b	5,029	0%	5,029	0%	5,027	0%
MA11	79,250	5%	MA5	301,437	21%	284,175	20%	252,333	17%
MA12	6,099	0%	MA6	999,920	68%	912,286	65%	1,043,601	72%
MA13	6,607	0%	MA7	5,748	0%	5,748	0%	5,747	0%
MA14	12,375	1%							
MA17	1,756	0%							
MA18	65	0%							
MA19	46,645	3%							
MA20	0	0%							
Total	**1,664,183**	**100%**		**1,466,605**	**100%**	**1,404,075**	**100%**	**1,449,999**	**100%**

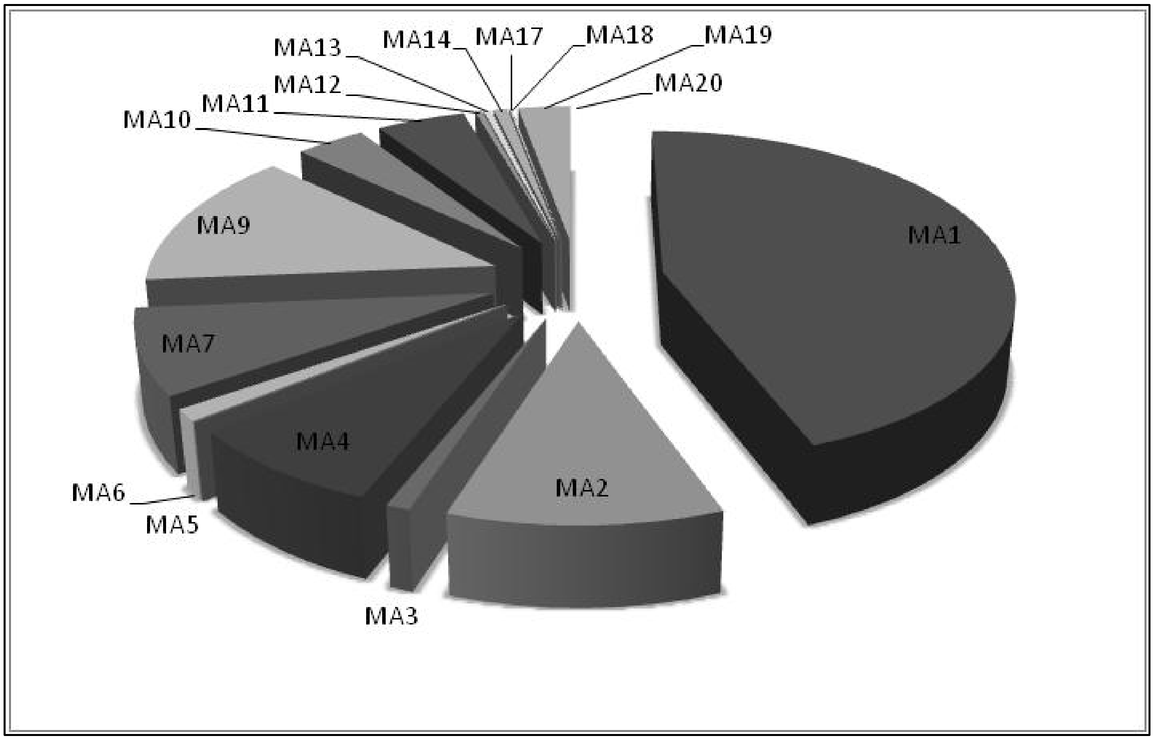


Figure 49. Relative acreages for each MA in the no-action alternative for the Kootenai Tribe of Idaho

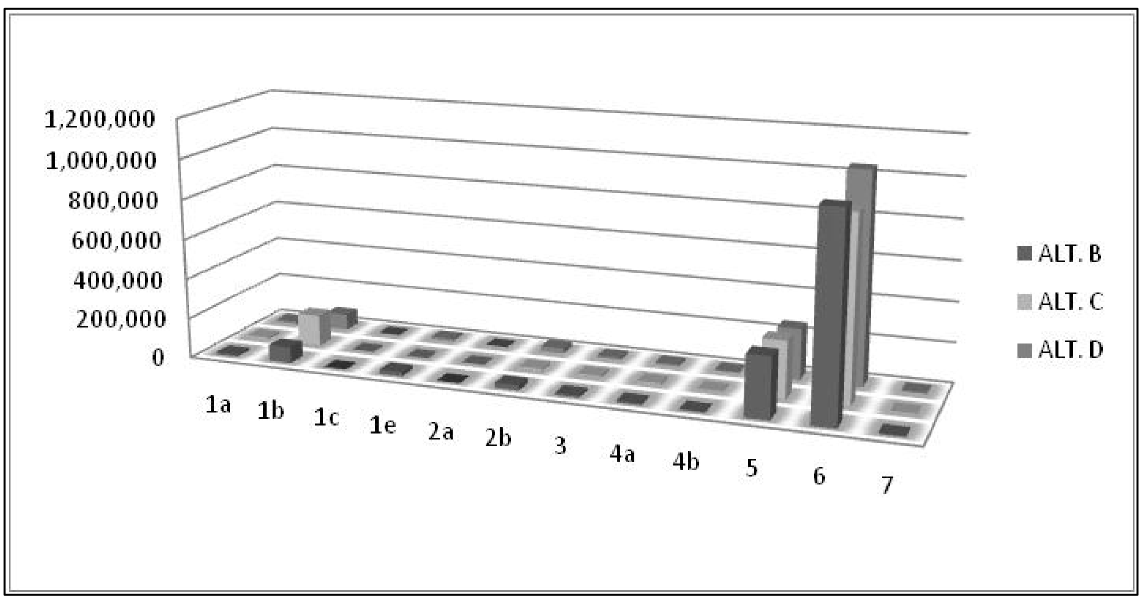


Figure 50. Relative Acreage by MA for Action Alternatives within the Kootenai Tribe of Idaho Ceded Lands

Cumulative Effects

The IPNF provides a wide and varied landscape that is relatively resilient regarding Tribal resource use, although sacred sites and archaeological sites of significance to the tribes are a nonrenewable resource, at least from a traditional or historical perspective. It is unlikely that any of the alternatives will cause an entire resource to be lost to the tribe, with the exception of those resources only collected at a specific place. Since this document is not meant to analyze small scale, project specific activities it is difficult to see how any of the alternatives will necessarily cause significant cumulative effects. There may be some room to look at specific MA designations and their boundaries with respect to those locations; however, since the tribes, for the most part, have not provided specific locations, it is not possible to analyze this situation.

Production of Natural Resources

This section includes the following resources:

- Timber
- Minerals
- Livestock Grazing
- Special Forest Products

Timber

Introduction

The IPNF contain valuable timber resources. They are important for providing habitat for plants and animals and products that are in demand by the American public. These products include lumber, house logs, pulpwood, posts and poles, and firewood. Because of the value of the timber resource, commercial timber harvest is used to move vegetation towards their desired conditions, improve watershed condition, improve wildlife habitat, and reduce wildfire risk through reduced fuel loads. Timber harvest also provides jobs and income in logging and manufacturing of wood products.

Legal and Administrative Framework

Law and Executive Orders

- **The Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act (NFMA) of 1976**: These acts set forth the requirements for Land and Resource Management Plans for the NFS.
- **The Multiple-Use Sustained Yield Act of 1960**: "It is the policy of the Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed and wildlife, and fish purposes…The Secretary of Agriculture is authorized and directed to develop and administer the renewable surface resources of the national forests for multiple-use and sustained yield of several products and services obtained there from…the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the national forests without impairment of the productivity of the land."
- **Organic Administration Act of 1897**: Forests are established "to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States."

Regulation and Policy

- **1982 Planning Rule Procedures**: The procedures of the 1982 NFS Land and Resource Management Planning Rule require the identification of areas suitable for timber production and the ASQ from those lands. In addition, the procedures require the analysis of the supply and demand situation for resource commodities.

Key Indicator

- Number of suitable acres available for timber production;
- Associated allowable sale quantity;
- Acres or predicted harvest; and
- Long-term sustained yield capacity.

Methodology and Analysis Process

Timber suitability was determined using various resource data and GIS to apply criteria and identify lands suitable for timber production. Criteria for suitability are defined in the 1982 Planning Rule Procedures at 36 CFR 219.14. Data was developed using the latest data sources and requirements to match the criteria defined by resource specialists.

Timber demand is based on a capacity and capability analysis completed by the University of Montana's Bureau of Business and Economic Research (McIver et al. 2012).

Timber harvest was modeled using Spectrum, a software modeling system designed to assist decision makers in exploring and evaluating multiple resource management choices and objectives. Models constructed with Spectrum apply management actions to landscapes through a time horizon and display resulting outcomes. Management actions are selected to achieve desired goals while complying with all identified management objectives. One of the goals for all action alternatives was the objective to move vegetation towards desired condition. Other goals that were applied for some alternatives included maximizing timber output and maximizing present net value. The Spectrum model was used to determine ASQ and acres treated by decade for each alternative.

Analysis Area

The analysis area for timber suitability is comprised of the NFS lands administered by the IPNF. The analysis area for timber demand consists of five counties comprising the timber impact zone. The analysis area for timber production is the lands suitable for timber production.

Changes between Draft and Final

The analysis on timber capacity and capability was updated between draft and final EIS. See McIver et al (2012). These updates are reflected in the timber demand section of the affected environment.

The Spectrum model was edited between draft and final EIS. Acres with natural disturbance (wildfire) were re-analyzed and updated in the final Spectrum model. The constraints for watersheds were adjusted to more accurately reflect management on the ground. The goals to move towards vegetation desired condition were also adjusted to reflect progress forestwide, rather than progress on lands suitable for timber production and lands not suitable separately. See appendix B for more detailed information on the changes made to the model between draft and final EIS. These updates in the model resulted in revised numbers for ASQ, predicted volume sold, long-term sustained yield capacity, and acres harvested for all alternatives.

The acres suitable for timber production were updated under Alternative B Modified to reflect changes in management area allocations from Alternative B.

Affected Environment

Timber Suitability

Lands suitable for timber production are the land base for determining ASQ and vegetation management for timber production. The 1987 Forest Plan determined 1,584,100 acres to be suitable for timber production. Timber suitability was determined through the use of resource data and computer models and followed the handbook and planning regulations that were in place at the time.

There have been many changes to timber suitability as the Plan has been amended and implemented over the past two decades. These changes include reductions in lands suitable for timber production in grizzly bear core areas, riparian areas, old growth, and management direction under the Idaho Roadless Rule(36 CFR 294 Subpart C). There have also been changes in data and land status, resulting in updated figures for timber suitability. As part of the Forest Plan revision, timber suitability was re-calculated to reflect these changes in management and data. Table 154 displays timber suitability at the time the 1987 Plan was adopted and amended as it is currently being implemented.

Table 154. Timber Suitability for the 1987 Plan

Suitability Category	1987 Plan - as Written	1987 Plan - as Amended and Currently Implemented
Total NFS Lands	2,478,500	2,497,700
Non-forest Land (1)	-161,700	-75,600
Withdrawn Lands (2)	-51,000	-23,300
Irreversible Resource Damage is likely (3)	0	-271,400
Adequate Restocking not assured (3)	-267,300	-50,400
Lands Tentatively Suitable for Timber Production	1,998,500	2,076,900
Lands where MA prescriptions preclude timber production, where management requirements cannot be met, or not cost efficient in meeting timber production objectives.	-414,400	-1,148,000
Lands Suitable for Timber Production	1,584,100	928,900

(1) Handbook direction at the time the 1987 Plan was developed had lands that were not productive (producing <20 cubic feet/acre/year) classified as "non-forested." The 1982 planning rule procedure does not consider low productive lands as non-forested. Because of this change in definition and updated data, the total forested NFS lands have increased from the 1987 Plan.

(2) Change in the amount of withdrawn lands is mostly due to a change in the order of subtraction and not a change in actual withdrawn areas.

(3) The difference between irreversible damage and adequate restocking is mostly due to how these areas were defined and the data used.

Timber Demand

Timber demand was analyzed as part of the 1987 Forest Plan. A potential timber demand of 190 - 253 MMBF per year was estimated for the IPNF (IPNF Forest Plan EIS, page II-82). This estimate was based on demand projections from an Idaho timber supply, analysis, and forest data.

Timber demand was updated in 2012 using a capacity and capability analysis for the Forest. This analysis was conducted by the University of Montana's Bureau of Business and Economic Research, resulting in a report prepared for the IPNF (McIver et al. 2012). The term "capacity" refers to the volume of timber (excluding pulpwood) that existing mills could utilize annually. The term "capability" refers to the volume of trees of a certain size class that existing mills can efficiently process annually. The following information on timber demand is excerpted from this report.

Virtually all of the IPNF non-reserved timberland is found in five Idaho counties: Benewah, Bonner, Boundary, Kootenai, and Shoshone. Three percent of the recent (2006) timber harvested in this area currently comes from the IPNF. Most (99 percent) of the timber harvested from these counties was from green (live) trees. The species composition of the harvested volume in this five-county area was as follows: Douglas-fir about 32 percent, true firs 29 percent, western redcedar 11 percent, and western larch 8 percent. Western hemlock and lodgepole pine each accounted for 6 percent of the harvest, while western white pine, ponderosa pine, red alder, and Engelmann spruce combined for the remaining 8 percent. Sawmills and veneer/plywood manufacturers received about 93 percent of the volume harvested from these counties. House logs, posts and small poles, and other mills received less than three percent of the timber harvest volume. Pulp and paper mills utilized four percent of the 2006 harvest from the five-county region.

The IPNF identified a five-county area as the “Idaho Panhandle National Forests Impact Zone.” An impact zone is a geographic area delineated to depict a functioning economy as well as the area influenced by management of the IPNF. This impact zone was used to determine the analysis area for the economic environment (see “Economic and Social Environment” for more information). The counties comprising the Idaho Panhandle National Forests impact zone are Benewah, Bonner, Boundary, Kootenai, and Shoshone counties in Idaho. Within this five-county area there are 31 timber-processing facilities currently operating as of 2011: 14 sawmills, 7 log home manufacturers, 3 log furniture manufacturers, 3 cedar products manufacturers, 2 post and small pole plants, and 2 veneer and plywood facilities.

Capacity to process timber in the IPNF impact zone is estimated at 180 million cubic feet (MMCF), with 54 percent of capacity being used in 2011. Mills in the IPNF impact zone are currently using about 97 MMCF of timber annually (table 155). Slightly less than 87 percent (84 MMCF) of the volume processed in the impact zone is composed of trees with diameter at breast height (DBH) greater than or equal to 10 inches. Just over 11 percent (11 MMCF) of the volume processed comes from trees 7.0 - 9.9 inches DBH, and nearly 2 percent (1.8 MMCF) of processed volume comes from trees less than 7 inches DBH.

Table 155. Annual Volume of Timber Processed by Tree Size Class (Excluding Pulpwood) for the Idaho Panhandle National Forests Impact Zone, 2011

Thousand Cubic Feet of Timber		Thousand Board Feet Scribner of Timber	
Tree DBH (inches)	**Volume Used**	**Tree DBH (inches)**	**Volume Used**
<7	1,862	<7	1,862 MCF
7-9.9	11,150	7-9.9	42,817
10+	84,319	10+	396,302
Total	**97,332**	**Total**	**440,981**

About 64 percent (116 MMCF) of existing capacity in the IPNF impact zone is not capable of efficiently utilizing trees less than 10 inches DBH (table 156). Nearly 64 MMCF of timber-processing capacity is capable of utilizing trees less than 10 inches DBH, and the majority of this is in the 7 to 9.9 inches DBH class.

Table 156. Annual Total Capacity and Capability* to Process Trees by Size Class (Excluding Pulpwood) for the Idaho Panhandle National Forests Impact Zone, 2011

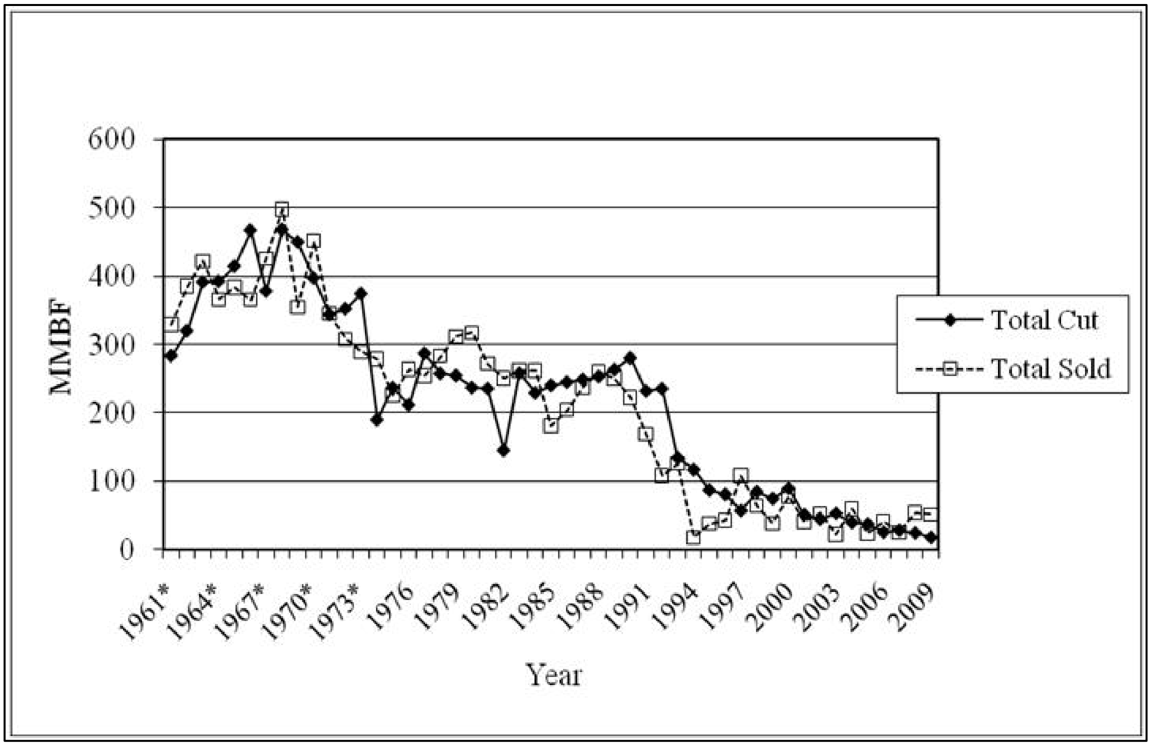
Thousand Cubic Feet of Timber		Thousand Board Feet Scribner of Timber	
Tree DBH (inches)	**Capability**	**Tree DBH (inches)**	**Capability**
<7	18,447	<7	18,447 MCF
7-9.9	45,441	7-9.9	174,492
10+	116,068	10+	545,519
Total Capacity	**179,956**	**Total Capacity**	**738,459**

* Note: Capability in <7 and 7-9.9 inch classes is the maximum volume capable of being used efficiently; capability in 10+ inches. Class is portion of total capacity NOT capable of efficiently using trees with DBH <10 inches.

A substantial amount of the capacity capable of utilizing smaller diameter trees is being used to process larger trees or is simply going unused. About 10 percent of capacity in the less than 7 inches DBH category is currently utilized to process trees less than 7 inches DBH, and slightly more than 24 percent of capacity in the 7 to 9.9 inches DBH category is being used to process trees 7 to 9.9 inches DBH. More than 11 MMCF of capacity capable of using trees 7 - 9.9 inches DBH are used annually to process trees greater than or equal to 10 inches DBH. Recent (2007-2011) poor market conditions for lumber have reduced mill demand for smaller diameter logs used to make studs. When markets are poor it becomes more difficult to profitably produce lumber from small and low quality logs. The price of stud grade lumber (which is predominantly made from small logs) fell by a much higher percentage during the recent recession than many other dimensions and board and shop lumber grades. This reduced the profitability of sawing lower grades of lumber from smaller and lower quality logs. As lumber markets recover, increased capacity utilization can be expected across all the size classes.

Timber Supply

Before the IPNF was established, timber was harvested on the Forest to meet the needs of the people living in the area. Like many other national forests, timber harvest on the Forest greatly increased in the 1960s to meet the demands of a rapidly growing economy. Figure 51 displays the total volume of timber cut and sold on the IPNF from 1961 to 2009. The amount cut is based on the amount sold by the Forest Service. The amount and timing of harvest from the volume under contract with the Forest Service is in response to market conditions and demand for timber products.



* Volume prior to 1974 is the total volume from the Coeur d'Alene, Kaniksu, and St. Joe National Forests

Figure 51. Volume Cut and Sold on the IPNF (in MMBF)

The 1987 IPNF Forest Plan set the ASQ at 2,800 MMBF for the first decade, or 280 MMBF annually. The ASQ was predicted to increase to 350 MMBF/year for the second decade.

Timber supply under the 1987 Forest Plan was described in the AMS Technical Report and in Forest Plan monitoring and evaluation reports. These documents show that timber supply levels have been below those projected in the 1987 Forest Plan. Reasons for the difference between projected and actual harvest levels include Forest Plan amendments (e.g., INFISH), new or updated threatened and endangered recovery direction, water quality concerns, and policies regarding entry into IRAs, public controversy, and a reduction in budget. The amount of timber sold on the IPNF averaged 52.5 MMBF/year in 2008 and 2009.

Environmental Consequences

General Effects

Timber Suitability

Lands tentatively suitable for timber production are constant for all alternatives. These are lands that are physically capable and have not been administratively withdrawn (such as wilderness) for timber harvest. Analysis identified 2,076,900 acres as tentatively suitable. See table 154 in the “Affected Environment” section above for a listing of acres that are not tentatively suitable for all alternatives (column “1987 Plan as Amended and Currently Implemented”).

From the lands tentatively suitable for timber, 699,200 acres were found to have other resource concerns that would preclude timber production as an objective. This includes riparian areas, grizzly bear core areas, and old growth. Depending on the MA, some of these acres may allow timber harvest for resource concerns other than timber production. Any timber harvest off these lands is not scheduled and would not occur on a rotation basis. These acres are not suitable for timber production.

Timber suitability is also affected by MA allocations. Lands in MA6 are suitable for timber production. All other MAs preclude timber production as an objective. Timber harvest may be allowed in other MAs (4b, 5, 7, and parts of 2a, 2b, and 3), but only to meet other resource objectives. These acres are not suitable for timber production. Table 157 displays timber suitability for each alternative.

Table 157. Timber Suitability by Alternative

Timber Suitability	Alternative A	Alternative B Modified	Alternative C	Alternative D
Acres Tentatively Suitable	2,076,900	2,076,900	2,076,900	2,076,900
Acres where management objectives limit timber harvest where mgmt requirements cannot be met	699,200	699,200	699,200	699,200
Acres where management precludes timber production as an objective	448,800	426,700	471,100	393,300
Acres Suitable for Timber Production	928,900	950,900	906,500	982,300
Percent of NFS Land Suitable for Timber Production	37%	38%	36%	39%

Alternative A is the current Plan as amended and implemented. Timber suitability has been updated to reflect Forest Plan amendments and current conditions (see earlier discussion on timber suitability for the 1987 Forest Plan). This update includes management direction from the Idaho Roadless Rule.

As the Plan is implemented on the ground, timber suitability may change based on site-specific analysis. Broad-scale information is used in determining lands suitable for timber production in the Plan. As a result, changes may occur at the project-scale level using site-specific data. Changes to timber suitability will be monitored during implementation of the Plan.

Timber harvest is allowed on lands not suitable for timber production (see FW-GDL-TBR-01), for such purposes as salvage, fuels management, insect and disease mitigation, protection or enhancement of biodiversity or wildlife habitat, or to perform research or administrative studies, or recreation and scenic-resource management. Timber harvest on these lands would have to be consistent with other management direction. Acres where timber harvest is allowed on land not suitable for timber production are as follows: Alternative A = 1,095,600 acres (44 percent of the Forest); Alternative B Modified = 1,072,400 acres (43 percent of the Forest); Alternative C = 1,035,400 acres (41 percent of the Forest); and Alternative D = 1,043,400 acres (42 percent of the Forest). Timber harvest on these lands is not scheduled or managed on a rotation basis, and do not contribute towards the allowable sale quantity or the predicted volume sold described below.

Allowable Sale Quantity and Predicted Volume Sold

The ASQ for each alternative was formulated by considering the lands suitable for timber production, vegetation desired condition, other multiple-use objectives, and the management requirements set forth in NFMA. The ASQ is a ceiling and is not constrained by budget. To develop a predicted volume sold a budget constraint reflecting current budgets was included for each alternative.

Timber harvest levels for the alternatives were calculated using Spectrum (see appendix B). The model was run with a mix of objective functions, based on the theme of the alternative. Alternative A was run with an objective to maximize timber production while Alternatives B Modified and C had objectives to move towards vegetation desired condition as quickly as possible, while meeting other resource objectives. Alternative D had an objective function to maximize timber and then to move towards vegetation desired condition. All solutions were finally run with an objective to maximize present net value to ensure economic efficiency in vegetation treatments. Table 158 displays the volume offer and ASQ for each alternative. The ASQ is a decadal number, but is shown as a yearly annual figure in this table. Outputs are shown by both million cubic feet (MMCF) and million board feet (MMBF) per year.

Table 158. Allowable Sale Quantity and Volume Sold by Alternative — Decade 1

Measure	Alt A[1]	Alt B Modified	Alt C	Alt D
Annual Allowable Sale Quantity MMBF/yr MMCF/yr	 124.9 22.3	 120.3 22.1	 115.9 21.2	 131.3 23.4
Predicted Volume Sold MMBF/yr MMCF/yr	 46.8 8.6	 44.6 8.3	 43.3 8.3	 46.3 8.5

[1] Numbers for Alternative A reflect the 1987 Plan as amended and implemented, including management direction under the Idaho Roadless Rule. These numbers are based on the latest data and the Spectrum model developed for plan revision.

Source: Spectrum model analysis

The effects on timber production are directly related to the amount of acres classified as suitable for timber production and acres within MA6. The amount of timber production is also directly related to the objective the model was run under based on the theme of the alternative. Alternative D has the highest and Alternative C the lowest ASQ and volume sold.

Table 159 displays the acres harvested in decade one to achieve the volumes shown in table 158. Acres harvested are a mix of silvicultural prescriptions, including even- or two-aged regeneration, uneven-aged management, and intermediate harvests. Alternative B Modified has the most acres harvested in achieving the ASQ and Alternative A the least. At the ASQ level, Alternatives B Modified and C have more intermediate harvest acres to move vegetation towards desired condition.

Table 159. Acres Harvested to meet ASQ and Volume Sold – Decade 1

	Alt A	Alt B Modified	Alt C	Alt D
Acres to meet ASQ	55,370	58,840	58,420	57,900
Acres to meet Predicted Volume Sold	48,670	44,700	60,360	29,120

Source: Spectrum model analysis

To ensure sustainability, a long-term sustained yield capacity (LTSYC) was calculated for the Forest based on management activities to achieve desired conditions. LTSYC is defined as “the highest uniform wood yield from lands being managed for timber production that may be sustained under specified management intensity consistent with multiple-use objectives" (1982 planning procedures, 36 CFR 219.3). The LTSYC is not constrained by budget. Table 160 displays the LTSYC for the Forests.

Table 160. Long-term Sustained-yield Capacity (LTSYC) by Alternative (MMCF/year)

Measure	Alt A	Alt B Modified	Alt C	Alt D
Long-term Sustained-yield Capacity	22.3	22.1	21.2	23.4

Source: Spectrum model analysis

Figures 52 through 55 displays the ASQ and volume offer in relation to the LTSYC for each alternative, because LTSYC is the highest wood yield sustainable, it is greater than or equal to ASQ. Because volume offer is limited by current budgets, it is well below the LTSYC for each alternative.

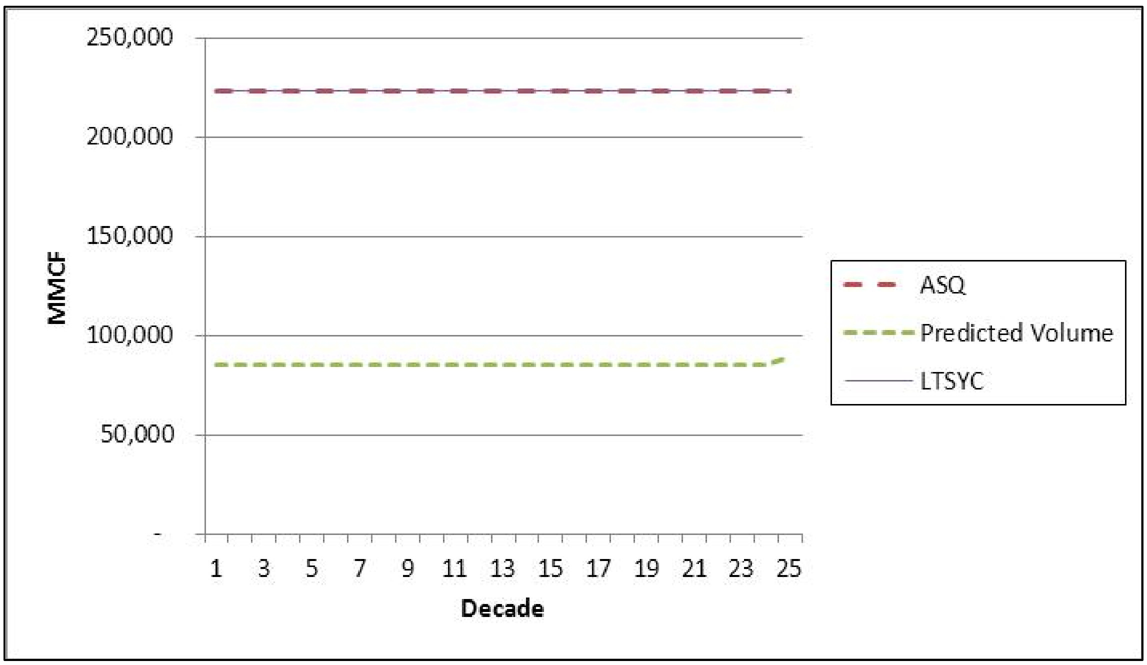


Figure 52. Alternative A - Allowable Sale Quantity, Predicted Volume, and Long-Term Sustained-Yield Capacity

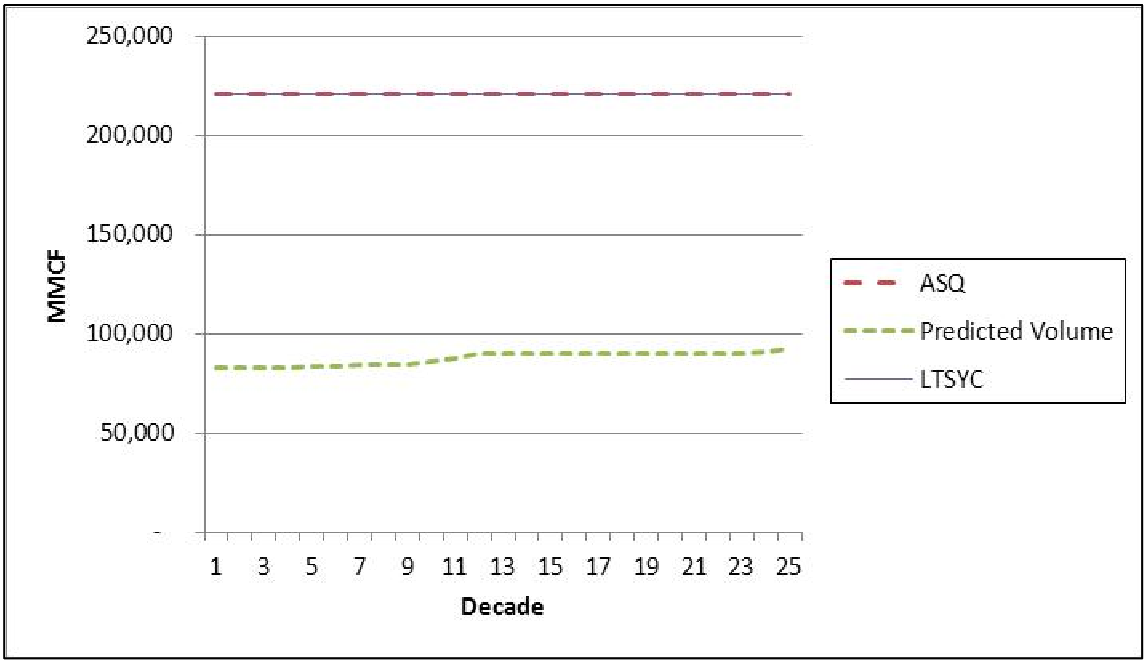


Figure 53. Alternative B Modified - Allowable Sale Quantity, Predicted Volume, and Long-Term Sustained-Yield Capacity

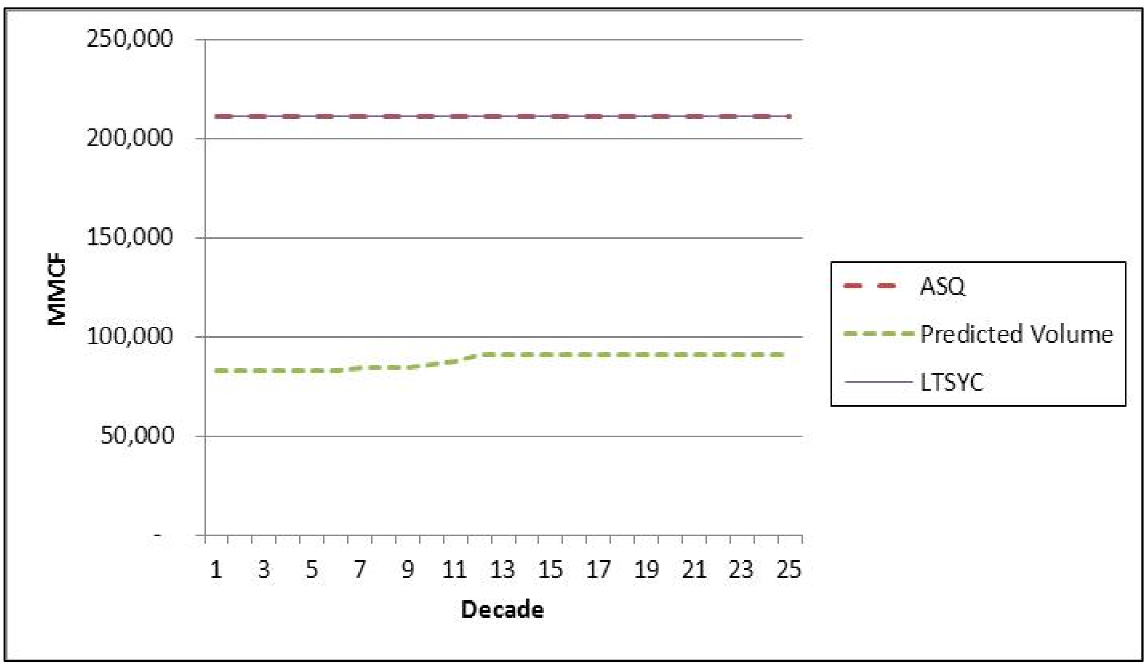


Figure 54. Alternative C - Allowable Sale Quantity, Predicted Volume, and Long-Term Sustained-Yield Capacity

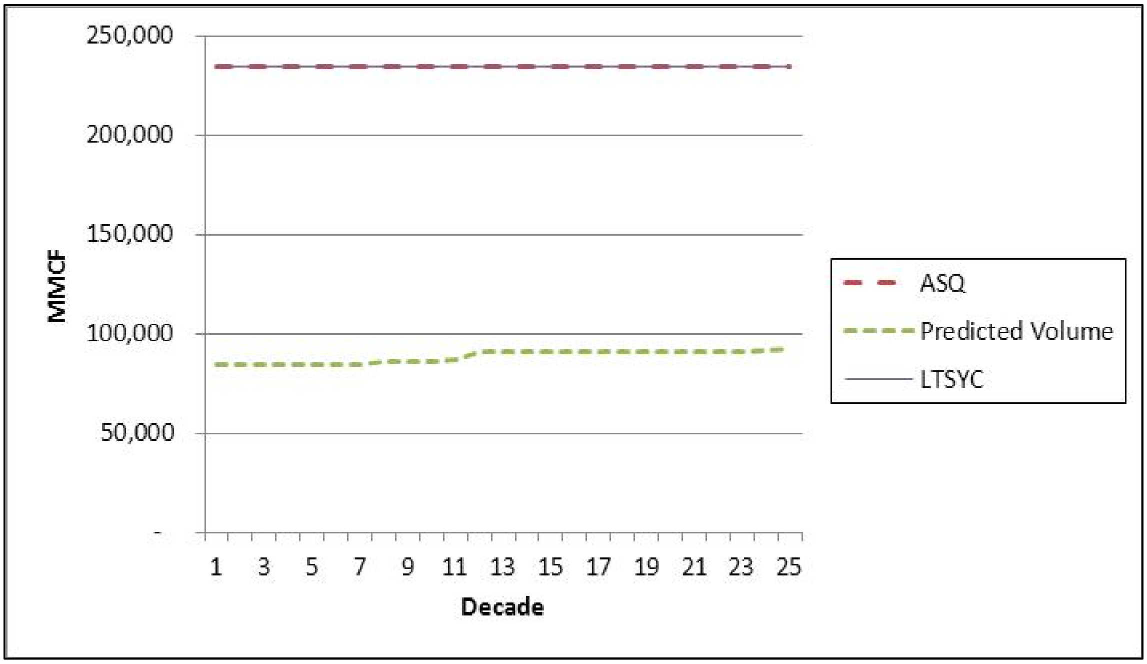


Figure 55. Alternative D - Allowable Sale Quantity, Predicted Volume, and Long-Term Sustained-Yield Capacity

Alternative D has the highest LTSYC, followed by Alternatives A and B Modified. The ASQ is at the LTSYC in all alternatives.

Additional analysis was conducted to meet the requirements of the 1982 planning procedures, including analysis on costs, benefits, and the efficiency of management prescriptions. See appendix B for a description of the analysis and documentation of the results.

Consequences to Timber from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Fire and Fuels

Fire and fuels management generally has a positive effect on timber management. The objectives for fuel reduction are consistent with commercial timber harvest. Timber harvest is often the tool for reducing fire risk through a reduction in fuel loading. Timber harvest also moves vegetation towards desired conditions that are more resilient and less fire-prone. Alternative D has the most management activities for fire and the most positive impact on timber harvest.

Effects from Aquatic Habitat, Riparian, Watershed, and Wildlife

Measures to protect aquatic habitat, riparian areas, watersheds, and wildlife limit the amount of timber that may be harvested. Riparian areas and certain wildlife areas (such as grizzly bear core areas) are not suitable for timber production. This reduces the amount of land available for scheduled timber harvest. Protection measures for watersheds, aquatic habitat, and wildlife limit the amount of openings and the type of harvest. All of these factors reduce the amount of timber harvest. The reduction in timber harvest is the same for all alternatives.

Effects from Inventoried Roadless Areas

The amount of IRAs that are allocated to MAs suitable for timber production varies by alternative. Table 161 displays acres suitable for timber production that are within IRAs. The table also shows the acres of IRAs that are scheduled for harvest sometime over the planning horizon (250 years) and the amount of timber harvest from these areas in the first decade. At the ASQ level, timber harvest in IRAs in the first decade is less than 1 MMBF/year in the first decade for all action alternatives and minimal acres are scheduled for harvest over the planning horizon. For the predicted volume sold level, no alternative schedules any acres for timber harvest.

Table 161. Acres Suitable for Timber Production, Percent Scheduled for Harvest, and First Decade Harvest within Inventoried Roadless Areas

Alternative	Acres Suitable for Timber Production in IRA	Percent Scheduled for Harvest (over 250 years)	Timber Harvest from IRA Decade 1 (MMBF/yr)
ASQ Level			
A	14,500	45%	0.0
B Modified	5,600	3%	0.1
C	5,500	4%	0.0
D	5,700	4%	0.8
Predicted Volume Sold			
A	14,500	0%	0.0
B Modified	5,600	0%	0.0
C	5,500	0%	0.0
D	5,700	0%	0.0

Timber harvest within IRAs is limited, requires additional analysis, and receives a great deal of public and agency scrutiny. Because of limited access and the additional analysis and public/agency involvement, unit costs for timber harvest are much higher within an IRA. No alternative schedules all IRA acres for timber harvest; no acres are scheduled under constrained budgets (the predicted timber volume level). Alternative A has the most acres of IRA suitable for timber production, with 45 percent of those lands scheduled for harvest under the ASQ level. However, management opportunities are expected to continue to be limited within IRAs and harvest within these areas may be infeasible.

Effects from Budget

The budget has a large effect on the amount of timber that can be harvested from the IPNF. As described previously, the ASQ is unconstrained by budget while the predicted volume sold is constrained by current budget levels. The budget that would be necessary to achieve ASQ would need to be nearly triple current levels in all alternatives.

Effects from Natural Disturbance

Insects, disease, and wildfire can affect the production of timber by killing and damaging trees. The Spectrum model included a predicted amount of wildfire on the Forest based on current fire suppression success and fire starts. See appendix B for more information on the Spectrum model.

Under all alternatives, there exists potential for salvage/sanitation cuts to harvest dead and damaged timber and to attempt to slow or impede infestations from spreading. The degree to which these harvests are undertaken will largely depend upon the risks associated with wildfire potential, infestation spread into healthy stands, public safety, the presence of high value resources, and the resource emphasis of the infected or adjoining area.

Under Alternatives B Modified and C, where there are more acres in recommended wilderness and backcountry management, there is a greater potential for infestations from insects and disease. There is also the potential for more wildfire. This could result in a short-term increase in timber harvest through salvage sales on lands where timber harvest is allowed.

Catastrophic events, such as large wildfires and epidemic insect outbreaks, were not included in the modeling because of uncertainty in the extent or timing of such an occurrence. If a catastrophic event does occur in the future, analysis would need to be conducted to determine if the event would warrant a Forest Plan amendment for changed conditions.

Cumulative Effects

There are many factors that influence and affect timber harvest. The demand for timber products, supply, laws, and regulations all affect the amount of timber that may be harvested from the IPNF. Budgets and court decisions also impact timber supply potential. The following is a brief description of some items that are changing or may change in the future, adding to the effects on timber harvest from the alternatives.

Demand and Future Timber Products

The demand for timber products is a driver in the amount of wood fiber supplied from the IPNF. The Idaho Statewide Forest Resource Strategy (Kimball and Stephenson 2010) identified the goal to create opportunities to build and sustain forest markets and enhance biomass market infrastructure. Diversifying markets and enhancing infrastructure leads to new products and new processing techniques, and affects the demand for wood fiber. If markets improve and demand for wood products increases, there will be the desire for more wood fiber from the IPNF. If demand decreases and mills close, there may be less desire for wood fiber from the IPNF. A decrease in demand may reduce the amount of timber sold from the IPNF under all alternatives.

Alternative Sources for Wood Fiber

The supply of wood fiber from private and state lands and adjacent national forests impacts IPNF demand. If wood fiber supplies decrease from private and state lands and adjacent national forest, there will be an increasing demand for wood fiber from the IPNF. If supplies increase from private and state lands and adjacent national forests, there may be a decrease in demand for wood fiber from the IPNF. A decrease in demand may reduce the amount of timber sold from the IPNF under all alternatives.

Development of Forestlands

The Idaho Statewide Forest Resource Strategy (Kimball and Stephenson 2010) identified development pressure as an issue for forestland. This development results in a loss of productive forests and pressure to eliminate management on adjacent lands. Development pressure can also lead to decreased timber harvest because of the loss of forests and the impact development has on watersheds and wildlife. The increased fragmentation limits the amount of harvest that may occur on adjacent national forest lands, while the decreased supply from private lands increases the demand for timber harvest from the IPNF. The limit on timber harvest from fragmentation of adjacent lands would limit the amount of timber sold from the IPNF under all alternatives.

Minerals

Introduction

The 192-million-acre NFS is an important part of the nation's resource base. As directed by the Organic Administration Act of 1897 and the Multiple Use-Sustained Yield Act of 1960, the national forests are managed by the USDA Forest Service for continuous production of their renewable resources – timber, clean water, wildlife habitat, forage for livestock, and outdoor recreation.

Although not renewable, minerals are resources of the national forests and are important to the nation's welfare. The national forests contain much of the country's remaining stores of mineral resources. Prime examples include: the national forests of the Rocky Mountains, the Basin and Range Province, the Cascade-Sierra Nevada Ranges, and the Alaska Coast range.

Geologically, NFS lands contain some of the most favorable host rocks for mineral deposits. Approximately 6.5 million acres are known to be underlain by coal. Approximately 45 million acres, or one-quarter of NFS lands, have potential for oil and gas; while about 300,000 acres within the Pacific Coast and Great Basin States have potential for geothermal resource development.

Within the past few years, the energy use and demand in this country has reminded us that the nation's mineral resources are limited. As with oil supplies, there will likely be tightening of world supplies of minerals. Such a trend is leading to considerable expansion of domestic mineral prospecting, exploration, and development. Much of this increased activity is on NFS lands where they are open to mineral exploration and development.

Forest Service Role in Minerals Management

In the Mining and Minerals Policy Act of 1970, Congress declared that it is the continuing policy of the federal government, in the national interest, to foster and encourage private enterprise in (among other goals) the development of domestic mineral resources and the reclamation of mined land. This federal policy applies to NFS lands.

The Forest Service recognizes the importance of NFS mineral resources to the well-being of the nation, and encourages bona-fide mineral exploration and development. But, it also recognizes its responsibility to protect the surface resources of the lands under its care. Thus, the Forest Service is faced with a double task: to make minerals from national forest lands available to the national economy, and at the same time, minimize the adverse impacts of mining activities on other resources.

Land management planning, as mandated by the NFMA of 1976, is a principal tool for assuring that mineral resources are given proper consideration. Before plans are developed, specialists evaluate resource activities including existing and potential mineral development. Planners and decision makers then formulate plans to minimize potential resource conflicts and maximize the various uses and values of NFS lands. Since mineral resources are often sub-surface, relatively rare, and are governed by certain preferential laws, the land management planning procedures provide for the availability of minerals and development of mineral operations where possible.

Minerals management of NFS lands requires interagency coordination and co-operation. Although the Forest Service is responsible for the management of surface resources of NFS lands, the BLM in the USDI is primarily responsible for management of government-owned minerals. Since it is not possible to separate mineral operations from surface management, the agencies have developed cooperative procedures to accommodate their respective responsibilities.

Legal and Administrative Framework

The following statutory authorities provide direction under which exploration and development of mineral and energy resources on NFS lands may be conducted:

Law and Executive Orders

Surface Management Authority

- **Organic Administration Act of June 4, 1897 (30 Stat. 11, as amended; 16 U.S.C. § 473 et seq.):** This act provides the Secretary of Agriculture the authority to regulate the occupancy and use of NFS lands. It provides for the continuing right to conduct mining activities under the general mining laws if the rules and regulations covering NFS lands are complied with. This act recognizes the rights of miners and prospectors to access NFS lands for all proper and lawful purposes, including prospecting, locating, and developing mineral resources.
- **Multiple-Use Sustained-Yield Act of June 12, 1960 (P.L. 86-517, 74 Stat. 215; 16 U.S.C. 528 et seq.):** This act requires that NFS lands be administered in a manner that considers the values of the various resources when making management decisions and specifically provides that nothing in the act be construed to affect the use or administration of the mineral resources on NFS lands.
- **Wilderness Act of September 3, 1964 (P.L. 88-577, 78 Stat. 890; 16 U.S.C. § 1121, et seq.):** This act provides that, subject to valid rights existing prior to January 1, 1984, wilderness areas are withdrawn from all forms of appropriation and disposition under the mining and mineral leasing laws. Subsequent acts designating additional NFS lands as wilderness may contain specific provisions concerning mineral activities. Patents issued under the mining laws for mining claims staked after passage of this act within wilderness areas shall reserve the surface rights to the United States. The act provides for reasonable access to valid mining claims and other valid occupancies inside wilderness areas. The act also requires the survey of wilderness areas by the U.S. Geological Survey on a planned, recurring basis consistent with the concept of wilderness preservation to determine the mineral values that may be present.
- **National Environmental Policy Act (NEPA) of 1969, January 1, 1970 (P.L.91-190, 83 Stat. 852; 42 U.S.C. § 4331 et seq.):** This act requires federal agencies to use a systematic interdisciplinary approach to ensure the integrated use of natural and social sciences in planning and decision making. It also requires an analysis of probable environmental effects of proposed federal actions. Generally, decisions on mineral and energy development are subject to this law.
- **Forest and Rangeland Renewable Resources Planning Act of August 17, 1974 (P.L. 93-378, 88 Stat. 476; 16 U.S.C. § 1600 et seq.):** This act directs the assessment of all resources on NFS lands to determine the desired level of future production from Forest Service programs. Once approved, the policy statement and recommended program serve as a guide to future Forest Service planning and a basis for future budget proposals.
- **National Forest Management Act (NFMA) of October 22, 1976 (P.L. 94-588, 90 Stat. 2949; 16 U.S.C. § 1600 et seq.):** The act requires the Forest Service to establish a comprehensive system of land and resource planning, including the development and maintenance of a comprehensive and detailed inventory of lands and resources. The act also

specifies the use of a systematic interdisciplinary approach to achieve integrated consideration of the physical sciences into planning for the management and use of NFS lands and resources.

Mineral Management Authorities

- **U.S. Mining Laws Act of May 10, 1872 (17 Stat. 91, as amended, 30 U.S.C. § 22 et seq):** This act (often referred to as the General Mining Act of 1872) sets forth the principles of discovery, right of possession, assessment work, and patent for hard-rock minerals on lands reserved from the public domain. The law applies to lode, placer, mill-site claims, and tunnel sites. Except as otherwise provided, all valuable mineral deposits, and the lands in which they are found, are free and open to exploration, occupation, and purchase under regulations prescribed by law.
- **Organic Administration Act of 1897 (30 Stat. 11, as amended, 16 U.S.C. § 473 et seq):** Reserved lands for national forests purposes and opened them to the operations under U.S. mining laws, provided individuals/operators comply with the rules and regulations of the Secretary of Agriculture. This act authorizes the Secretary of Agriculture to regulate occupancy and use of the national forests. The act permits access to national forests for all lawful purposes, including prospecting, locating, and developing mineral resources.
- **Weeks Law Act of March 1, 1911 (P.L. 61-435, 72 Stat. 1571, as amended, 16 U.S.C. § 480 et seq):** This act authorized the federal government to purchase lands for stream-flow protection, and maintain the acquired lands as national forests.
- **Mineral Resources on Weeks Law Lands Act of March 4, 1917 (P.L. 64-390, 39 Stat. 1149, 16 U.S.C. § 520):** This act authorizes the Secretary of Agriculture to issue permits and leases for prospecting, developing, and utilizing hard-rock minerals on lands acquired under the authority of the act. This authority was later transferred to the Secretary of the Interior.
- **Mineral Leasing Act of February 25, 1920 (P.L. 66-146, 41 Stat. 437 as amended, 30 U.S.C. § 181 et seq.):** This act authorizes the Secretary of the Interior to issue leases for the disposal of certain minerals (coal, phosphate, sodium, potassium, oil, oil shale, gilsonite, and gas). The act applies to NFS lands reserved from the public domain, including lands received in exchange for timber or other public domain lands, and lands with minerals reserved under special authority.
- **Clarke-McNary Act of June 7, 1924 (P.L. 68-270, 43 Stat. 653 as amended, 16 U.S.C. § 505 et seq.):** All lands to which title is accepted under section 7 of this act become national forest lands, subject to all laws applicable to the lands acquired under the Weeks Act of March 1, 1911.
- **Mineral Materials Act of July 31, 1947 (P.L. 80-291, 61 Stat. 681, as amended, 30 U.S.C. § 601 et seq.):** This act provides for the disposal of mineral materials on the public lands through bidding, negotiated contracts, and free use.
- **Mineral Leasing Act for Acquired Lands of August 7, 1947 (P.L. 80-382, 61 Stat. 913, as amended, 30 U.S.C. § 351 et seq.):** This act extends the provisions of the mineral leasing laws to federally owned mineral deposits on acquired NFS lands and requires the consent of the Secretary of Agriculture prior to leasing.
- **Multiple Use Mining Act of July 23, 1955 (P.L. 84-167, 69 Stat. 368, as amended, 30 U.S.C § 601 et seq.):** This act requires the disposal of common varieties of sand, stone, gravel, pumice, pumicite, and cinders under the provisions of the Materials Act of July 31, 1947, and gives to the Secretary of Agriculture the authority to dispose of these materials. It

also provides that rights under any mining claim located under the mining laws are subject to the right of the United States to manage and dispose of surface resources.

- **Geothermal Steam Act of December 24, 1970 (P.L. 91-581, 84 Stat. 1566, 30 U.S.C. § 1001-1025):** This act provides the Secretary of the Interior the authority to lease NFS lands for geothermal steam development, subject to the consent and conditions the Secretary of Agriculture may prescribe.
- **Mining and Minerals Policy Act of December 31, 1970 (P.L. 91-631, 84 Stat.1876, 30 U.S.C. § 21a):** This act states that the continuing policy of the federal government is to foster and encourage private enterprise in the development of economically sound and stable domestic mining and minerals industries and the orderly and economic development of domestic mineral resources.
- **Federal Coal Leasing Amendments Act of August 4, 1976 (90 Stat. 1083; 30 U.S.C. § 201 et seq.):** This act amended the Mineral Lands Leasing Act of February 25, 1920 (para. 3) by specifying that coal leases on NFS lands may be issued only after the consent of the Secretary of Agriculture and adherence to conditions the Secretary may prescribe. The act also provides that no lease shall be issued unless the lands involved in the lease have been included in a comprehensive forest land and resource management plan and the sale is compatible with the Plan. The act authorizes the issuance of a license to conduct exploration for coal.
- **Federal Land Policy and Management Act of October 21, 1976 (P.L. 94-579, 90 Stat. 2713, 43 U.S.C. § 1701 et seq., 7 U.S.C. § 1212a, 16 U.S.C. § 478a, 1338a):** This act defines procedures for the withdrawal of lands from mineral entry. It reserves to the United States the rights to prospect for, mine, and remove the minerals in lands conveyed to others and requires the recordation of claims with the BLM.
- **Surface Mining Control and Reclamation Act of August 3, 1977 (P.L. 95-87, 91 Stat. 445, 30 U.S.C. § 1201-1328):** This act provides for cooperation between the Secretary of the Interior and states in the regulation of surface coal mining. It also restricts or prohibits surface coal mining operations on NFS lands, subject to valid existing rights and compatibility determinations.
- **Energy Security Act of June 30, 1980 (P.L. 96-294, 94 Stat. 611, 42 U.S.C. § 8855):** This act directs the Secretary of Agriculture to process applications for leases and permits to explore, drill, and develop resources on NFS lands, notwithstanding the current status of the forest land and resource management plan.
- **National Materials and Minerals Policy, Research and Development Act of October 2, 1980 (94 Stat. 2305; 30 U.S.C. §1601-1605):** This act restates congressional intent to promote policies that provide for an adequate and stable supply of materials while considering long-term needs, a healthy environment, and natural resource conservation. The act also requires the Secretary of the Interior to improve the availability and analysis of mineral data in federal land use decision making.
- **Omnibus Parks and Public Lands Management Act of 1996 (P.L. 104-333, 110 Stat. 4093, 16 U.S.C. § 497c):** This act automatically withdraws from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral and geothermal leasing all lands located within the boundaries of ski area permits.
- **Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. § 181 et seq.):** This act expands the authority of the Secretary of Agriculture in the management of oil and gas resources on NFS lands. The BLM cannot issue leases for oil and gas on NFS lands over

the objection of the Forest Service. The Forest Service must approve all surface disturbing activities on NFS lands before operations commence.

- **Federal Cave Resources Protection Act of 1988 (102 Stat. 4546; 16 U.S.C. § 4301-4309):** Provides for protection and preservation of caves on federal lands.
- **Energy Policy Act of 2005 (PL 109-58):** Directs federal agencies to undertake efforts to ensure energy efficiency; and the production of secure, affordable, and reliable domestic energy.
- **Executive Order 13211 issued May 18, 2001:** This executive order titled "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use" requires federal agencies to prepare and submit a Statement of Energy Effects to the Office of Management and Budget describing the effects of certain regulatory actions on energy supply, distribution, or use.
- **Executive Order 13212 issued May 18, 2001:** This executive order titled "Actions to Expedite Energy-Related Projects" requires federal agencies to take actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy.
- **The Reorganization Plan No. 3 of 1946 (60 Stat. 1097; 5 U.S.C. Appendix):** This transferred the functions of the Secretary of Agriculture with respect to permits and leases for hard-rock minerals on acquired Weeks Law land to the Secretary of the Interior. However, Secretary of Agriculture Consent to the issuance of permits or leases is required.

Code of Federal Regulations (CFR)

- **36 CFR 219 – Planning:** These regulations implement the NFMA of 1976 (16 U.S.C. 1600 et seq.), require consideration of the relationship of nonrenewable resources, such as minerals, to renewable resources, and set forth the minimum requirements for integrating the nonrenewable mineral resource into a forest plan.
- **36 CFR 228 – Minerals:** These regulations set forth rules and procedures governing use of the surface of NFS lands in conjunction with operations authorized by the general mining laws, oil and gas leasing, and mineral material disposal laws.
    - Subpart A: Locatable Minerals
    - Subpart B: Leasable Minerals (reserved)
    - Subpart C: Disposal of Mineral Materials
    - Subpart D: Miscellaneous Minerals Provisions
    - Subpart E: Oil and Gas Resources
- **36 CFR 251 –** Land Uses
- **43 CFR 2300 –** Land Withdrawals

Interagency Agreements

The Forest Service has entered into interagency agreements with agencies within the USDI to cooperate and coordinate in the management of federally owned minerals within NFS lands. The principal agreements include:

- A November 8, 1946, agreement with the BLM detailing procedures for mineral leases and permits administered under section 402 of the President's Reorganization Plan No. 3 of 1946.

- A May 18, 1957, MOU with the BLM describing work procedures for land applications, mining claims, and patents.
- A March 4, 1977, cooperative agreement with the U.S. Geological Survey concerning oil and gas operations.
- A May 20, 1980, MOU with the BLM describing the coordination of activities under the federal coal management program.
- A November 26, 1980, cooperative agreement with the U.S. Geological Survey for operations under solid mineral leases and permits.
- A December 3, 1981, MOU with the U.S. Geological Survey and the BLM for the geothermal steam leasing program.
- A July 31, 1990, MOU with the Office of Surface Mining Reclamation and Enforcement describing the management of surface coal mining operations on NFS lands.
- A November 11, 1991, interagency agreement with the BLM describing the procedures by which the Forest Service could authorize the BLM to offer NFS lands for oil and gas leasing.
- A November 19, 1991, interagency agreement with the BLM describing the procedures for coordinated administration of oil and gas operations on federal leases within the NFS.

Key Indicators

- Locatable minerals – acres available for mineral development;
- Leasable minerals – acres available for leasing proposals; and
- Mineral materials – acres available for disposal of mineral materials.

Methodology and Analysis Process

The acres that are available for locatable mineral resource development are determined by subtracting the number of acres that are withdrawn from the total number of acres for the IPNF.

The number of acres that are withdrawn from mineral entry is a matter of record. By law, the BLM keeps official records in the General Land Office. Current records are kept in the LR2000 database. These records are the source for the documentation of withdrawn lands on the IPNF.

The number of acres that are available for leasing proposals is determined by subtracting the number of acres that are legally unavailable from the total number of acres on the IPNF.

Lands which are legally unavailable for leasing are:

- Lands withdrawn from mineral leasing by an act of Congress or by an order of the Secretary of the Interior;
- Lands recommended for wilderness allocation by the Secretary of Agriculture;
- Lands designated by statute as wilderness study areas, unless oil and gas leasing is specifically allowed by the statute designating the study area; and
- Lands within areas allocated for wilderness or further planning in Executive Communication 1504.

The number of acres that are available for disposal of mineral materials is determined by subtracting from the total number of acres on the IPNF, the number of acres where the Forest Service has exercised its discretion to refrain from authorizing the disposal of mineral materials.

Affected Environment (Existing Condition)

A variety of mineral deposit types and mineral resources, including gold, silver, and copper, occur within the boundaries of the IPNF. The silver valley (Coeur d'Alene River basin) is named because of its rich silver deposits. The Forest Service recognizes that minerals are fundamental to the nation's well-being, and as policy, encourages the exploration and development of the mineral resources it is authorized to manage. The Secretary of Agriculture has provided regulations (36 CFR 228) to ensure surface resource protection, while encouraging the orderly development of mineral resources on NFS lands. Please refer to figure 56 which shows mineral potential on the IPNF. Oil and gas potential across the IPNF is low.

With respect to national forest management, mineral resources are divided into three groups: locatable minerals, leasable minerals, and mineral materials. The authority of the Forest Service to influence and regulate the exploration, development, and production phases of mining operations varies with each group. As a result, the Forest Service manages mineral resource programs that are specific to each group.

Locatable Minerals

Locatable minerals are those valuable deposits subject to exploration and development under the General Mining Law of 1872 (as amended). These resources are commonly referred to as hard-rock minerals; and include gold, silver, and copper.

Lands open to operations under the General Mining Law include all areas of the national forests except those formally withdrawn from mineral entry either by Congress or the Secretary of the Interior or otherwise exempted.

On the IPNF, there are about 47,720 acres currently withdrawn leaving approximately 2,449,880 acres available for locatable mineral development.

The General Mining Law of 1872, as amended, grants every United States citizen the right to prospect and explore lands reserved from the public domain and open to mineral entry. The right of access is guaranteed and is not a Forest Service discretionary action.

Upon discovering a valuable mineral deposit, citizens have the right to locate a mining claim and remove the mineral resources. The citizen holding a mining claim is the claimant. The claimant is responsible for initiating mining activities and investing the capital required to conduct mineral exploration, site development, mine operation, and reclamation of the site.

The Forest Service works with mining claimants to provide reasonable access to their claims, minimize adverse environmental impacts on surface resources, and ensure reasonable reclamation of disturbed lands affected by mining operations. Protection of surface resources is accomplished by reviewing the mining plan of operations submitted by the claimant; disclosing impacts of the proposed mining operations in a site-specific environmental document; approving only those activities that are reasonably necessary for the proposed operation; monitoring operations to ensure environmental standards are met; and ensuring prompt and reasonable reclamation of disturbed areas.

By law, certain lands such as lands withdrawn by an act of Congress (i.e., through the Wilderness Act of 1964 or the Wild & Scenic Rivers Act of 1968) and lands withdrawn by an order of the Secretary of the Interior are withdrawn from mining claim location. These withdrawn areas are; however, subject to mining claims with valid existing rights established before the date the areas were withdrawn from mineral entry. As a consequence, some mining claims located within existing or proposed withdrawn areas could be developed in the future.

Current Mining Operations

Across the IPNF there are approximately 25 approved Plans of Operations for various small lode and placer mining sites as well as exploration activities investigating larger deposits. A NOI is submitted by a claimant prior to any approval for these types of mining activities. The IPNF annually receives around 75 of these NOIs per year.

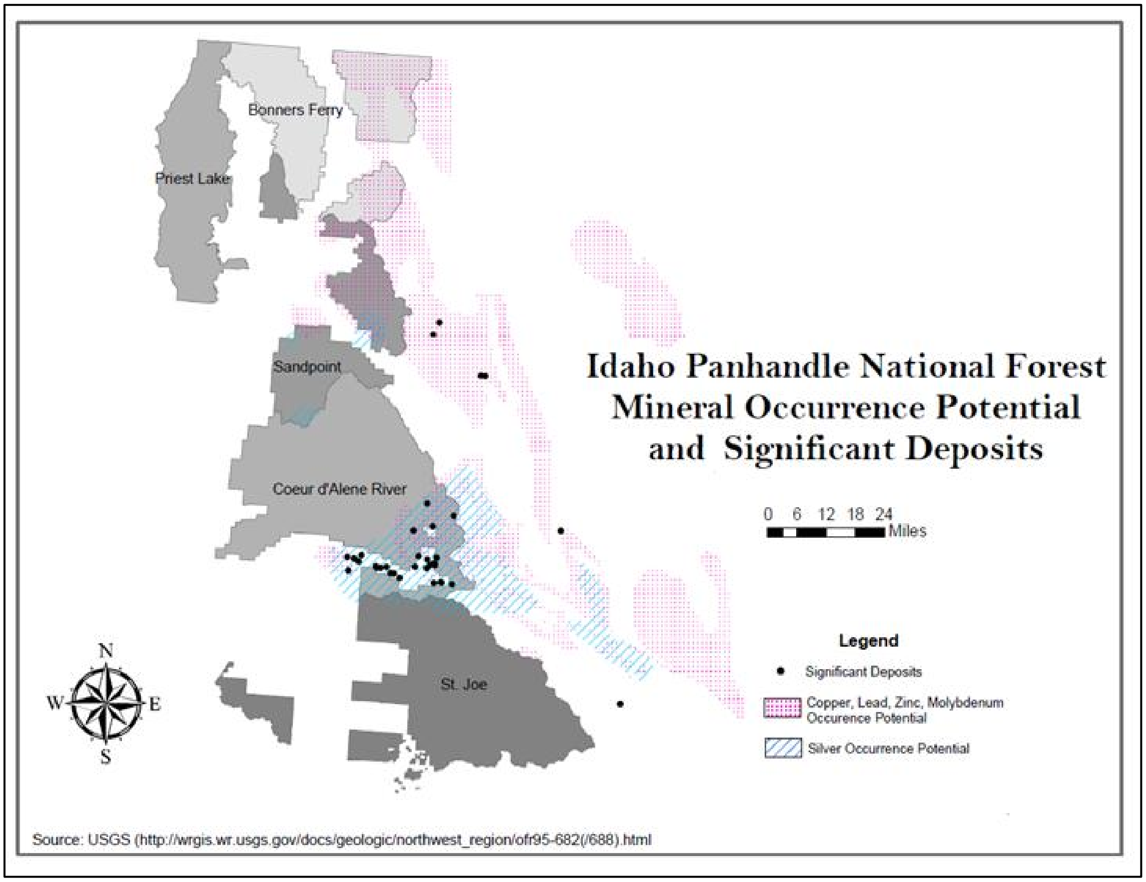


Figure 56. Displays the Locatable Minerals potential for the IPNF

Leasable Minerals (Oil and Gas)

Certain types of minerals, primarily energy resources, are not subject to mining claim location, but are available for exploration and development under provisions of the Mineral Leasing Act of 1920 (as amended). Access to these types of minerals is provided through leases, permits, or licenses that include fee and/or royalty payment conditions. Federally owned leasable minerals include oil, gas, coal, geothermal resources, potassium, sodium, phosphates, oil shale, and sulfur.

The authority to manage these minerals is presently administered by the USDI and BLM. The USDI is statutorily required to obtain consent from the Forest Service before it issues leases for leasable minerals on NFS lands.

The IPNF are not proposing to do any leasing analysis in this EIS. As per 36 CFR 228.102 (c), any further leasing analysis will be done under a separate environmental document.

No leasable minerals are presently being produced on the IPNF and the anticipated demand is expected to remain low. Oil and gas occurrence potential is low across the IPNF and geothermal resources are not known to occur.

Idaho Roadless Area Management direction in 36 CFR 294 Subpart C prohibits the Forest Service from recommending, authorizing, or consenting to road construction/reconstruction for new mineral or energy leases in Idaho Roadless Areas managed under the backcountry restoration theme. Idaho Roadless Area Management direction permits surface use or occupancy without road construction or reconstruction for all mineral leasing in the backcountry/restoration theme unless prohibited in the LMP.

By regulation (36 CFR 228.102) certain lands are legally unavailable for leasing: lands withdrawn from mineral leasing by an act of Congress or by the Secretary of the Interior; lands recommended for wilderness allocation by the Secretary of Agriculture; and lands designated by statute as wilderness study areas (unless oil and gas leasing is specifically allowed by the statute designating the study area). On the IPNF there are about 32,806 acres that are legally unavailable for mineral leasing, leaving approximately 2,464,794 acres available for mineral leasing proposals.

Mineral Materials

Often referred to as salable minerals, or “common variety” minerals, they are subject to the Mineral Materials Act of 1947 (as amended). These minerals are disposed of by sale, issuance of free-use permits, or under contracts for in-service needs. These minerals include petrified wood, common varieties of sand, rock, stone, cinders, gravel, pumice, clay, and other similar materials. Such common variety mineral materials include deposits that, although they have economic value, tend to be relatively widely available and do not have a distinct and special value. These minerals are most commonly used as building, landscaping, and construction materials.

The predominant salable material extracted on the IPNF is crushed rock used for road surfacing and fill. The demand for quality rock sources is often dependent upon the locations of active management operations and the needs for resource protection. Presently there is an adequate supply of rock sources of suitable quality (hardness and durability) across the Forest for in-service construction uses. The Forest currently has 371 inventoried gravel pits spread across the Forest. There is a public demand for salable materials predominantly used for construction and landscaping purposes. There are approximately 100 permits administered annually for personal use, public works, or commercial uses on the IPNF.

Garnet mining for both sands and larger gem quality garnets is also present on the IPNF. Commercial activity for sands and gems has been relatively inactive with very low production in the last 10 years, although the IPNF public garnet digging area is very popular with 6,000 to 7,000 permits sold each year.

Mine Reclamation

Mine reclamation is divided into small and large projects. Small sites usually require little rehabilitation work other than closing the mine opening with some sort of barrier. Approximately 292 sites need a variety of treatments to ensure they are inaccessible to the general public. On average, 15 mine openings are closed annually and a total of 225 closures have been accomplished since the beginning of the closure program in 1995. Larger sites need more work and often are reclaimed using the Comprehensive Environmental Response, Compensation, and Liability Act. This 1980 law requires the parties responsible for the contamination to conduct or pay for the cleanup. If the EPA's efforts to take an enforcement action for the cleanup are not successful, the federal government can clean up a site using the Comprehensive Environmental Response, Compensation, and Liability Act Trust Fund. There are currently 2 active large cleanup efforts taking place on the IPNF. Over the past 10 years 9 large sites have been reclaimed. Several hundred remaining inventoried sites are candidates for further assessments and consideration for reclamation work.

Environmental Consequences

General Effects

None of the alternatives propose to make any site-specific changes to the existing availability of land for mineral resources on the IPNF. Additional withdrawals need to be processed for Special Areas and RNAs. None are proposed at this time and these proposals would not vary by Forest Plan alternative.

Consequences to Minerals from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Management Area Prescriptions

Locatable Minerals

Alternatives A, B Modified, C, and D do not propose any additional lands for withdrawal to mineral entry. There is no difference between Alternatives A, B Modified, C, or D regarding the lands available for locatable mineral development.

Leasable Minerals

Alternative A does not make any lands administratively unavailable for mineral leasing although it does identify approximately 25,400 acres where no surface occupancy stipulations would apply and approximately 294,800 acres where leasing was not compatible with long-term goals.

Alternatives B Modified, C, and D do not propose to make any lands administratively unavailable for mineral leasing. Neither do they make any stipulations as to surface use or occupancy. Any stipulations would be identified at the site-specific level through the NEPA process.

In relation to access, Alternatives A, B Modified, C, and D is impacted the same by the Idaho Roadless Area Management regulations. Road construction or reconstruction associated with mineral leases may not occur in Inventoried Roadless Area that lies within Idaho and are designated as backcountry/restoration.

Mineral Materials

The availability of mineral materials would vary by alternative in that any areas allocated as recommended wilderness (MA1b) would not allow for disposal of mineral materials. Alternative C would be most limiting followed by Alternative B Modified, D, and A (see table 162).

Table 162. Summary of Lands Available for Disposal of Mineral Materials

	Disposal of Mineral Materials Available	Disposal of Mineral Materials Not Allowed or Should Not Occur
Alt. A	2,176,500 ac. (87%)	321,200 ac. (13%)
Alt. B Modified	1,538,281 ac. (62%)	959,419 ac. (38%)
Alt. C	1,422,481 ac. (57%)	1,075,219 ac (43%)
Alt. D	1,606,081 ac. (64%)	891,619 ac. (36%)

Effects from Vegetation Management

Vegetation management direction in any of the four alternatives would not result in any change in the lands available for locatable minerals, leasable minerals, or mineral materials development.

Effects from Wildlife Management

Wildlife management direction in any of the four alternatives would not result in any change in the lands available for locatable minerals, leasable minerals, or mineral materials development.

Habitat security requirements for grizzly bear can be expected to affect locatable mineral exploration and development. Where roads, and the access they provide, are necessary, limitations on road construction and operating seasons can be expected to have the effect of prolonging exploration or development work. Areas most affected would be BMUs in the Cabinet- Yaak and Selkirk Recovery Zones and mapped areas of grizzly bear occupancy outside of but adjacent to the Cabinet-Yaak and Selkirk Recovery Zones.

Mineral and energy exploration and development is likely to be affected in lynx analysis units in occupied habitat. Guideline HU G12 in the NRLMD ROD (USDA Forest Service 2007 March) gives direction that winter access should be limited to designated routes or designated over-snow routes.

Effects from Aquatic Management

Aquatic management direction in any of the four alternatives would not result in any change in the lands available for locatable minerals, leasable minerals, or mineral materials development.

Surface occupancy associated with leasable minerals would not be allowed in Riparian Habitat Conservation Areas unless there are no other options for location, and the riparian management objectives can be attained and adverse effects to inland native fish can be avoided (INFISH Standard MM-4). This limitation on surface occupancy does not vary between alternatives since Riparian Habitat Conservation Areas do not vary between alternatives. Because of the low occurrence potential, and the expected low demand for leases, there is likely to be little to no effect to leasable minerals.

Effects from Recreation Management

Recreation management direction in any of the four alternatives would not result in any change in the lands available for locatable minerals, leasable minerals, or mineral materials development.

Effects from Fire and Fuels Management

Fire and fuels management direction in any of the four alternatives would not result in any change in the lands available for locatable minerals, leasable minerals, or mineral materials development.

Effects from Lands and Special Uses Management

Lands and Special Uses direction in any of the four alternatives would not result in any changes in the lands available for locatable minerals, leasable minerals, or mineral materials development.

Cumulative Effects

Cumulative effects evaluate the potential impacts to mineral resources from the proposed action when combined with past, present, and reasonably foreseeable actions. The lands within the IPNF boundary form the geographic scope for cumulative effects since this is the scope for Alternative B Modified. The temporal bound would be the life of the Forest Plan which is estimated to be a fifteen-year time span.

In order to integrate the contribution of past actions to the cumulative effects of the proposed action and alternatives, existing conditions are used as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior actions that have affected access and might contribute to cumulative effects.

Mineral resources across the Forest are likely to be influenced by a variety of factors, and as described in the “Affected Environment” section, there are a number of actions that may occur over the life of the Plan.

The possibility of a large mine proposal in the future is probable with several large companies presently conducting exploration activities. Requests for authorization of small lode and placer mining operations can be expected to continue but it is not possible to predict how many may be submitted in any given year or how many might be authorized. Since Congress has imposed a moratorium on patenting of mining claims there would be no changes in patented lands unless Congress were to lift the moratorium.

Given the low probable occurrence of leasable minerals on the IPNF, and the court decision in Conner vs. Burford, there is little likelihood of mineral lease applications being made on the IPNF.

Mineral material use can be expected to continue for in-service needs (e.g., road maintenance and watershed improvement activities) and as a salable commodity and would result in the further depletion of that non-renewable mineral resource from NFS lands.

Reclamation work can be expected to start on the Idora and the Upper St. Joe mining sites. Reclamation work is likely on select abandoned mine sites as well as on mineral material sites that have reached the end of their useful life.

Livestock Grazing

Introduction

Suitable rangelands are lands capable of producing forage for livestock and wildlife. Rangelands may consist of meadows, riparian areas, alpine areas, or open-canopy forest. Wildlife depends upon rangelands for forage and cover throughout the year.

Livestock producers, as well as outfitters, guides, and visitors depend upon forage for their riding and pack stock. Range vegetation is managed to provide high quality wildlife habitat and forage for both livestock and wildlife.

Legal and Administrative Framework

Law and Executive Orders

- **The Granger-Thye Act (1950):** Provides for the issuance of term grazing permits for up to 10 years. It also provides for the use of grazing receipts for range improvement work.
- **The Multiple-Use Sustained-Yield Act (1960):** Provides that national forests are established and administered for several purposes, including livestock grazing. This act also authorizes the Secretary of Agriculture to develop the surface renewable resources of national forests for multiple uses and sustained yield of the services and products to be obtained from these lands, without impairment of the productivity of the land.
- **The Wilderness Act (1964):** Provides that livestock grazing, and the activities and facilities needed to support it, are allowed to continue in wilderness areas when such grazing was established before designation.
- **The Forest and Rangeland Renewable Resource Planning Act (1974):** Directs the Secretary of Agriculture to develop a process for the revision of national forest land and resource management plans, including the identification of the suitability of lands for resource management.
- **The Federal Land Policy and Management Act (1976):** States that public lands will be managed in a manner that will provide food and habitat for fish, wildlife, and domestic animals.
- **The Public Rangelands Improvement Act (1978):** Recognizes the need to correct unsatisfactory conditions on public rangelands by increasing funding for maintenance and management of these lands.
- **The Rescission Bill (1995):** Directs the Forest Service to complete site-specific NEPA analyses and decisions on allotments on a scheduled basis.

Other

- **Allotment Management Plans:** Developed through site-specific environmental analysis, an allotment management plan uses Forest Plan direction and current issues to determine desired conditions, areas suitable for grazing, and a broad strategy on how to meet desired conditions. They describe site-specific grazing strategies, stocking, structural and non-structural range improvement needs, and coordination with other resources. The output, or animal unit months (AUMs), is a result of the allotment management plan requirements, range improvements, and the ability of the permit holder to manage forage and livestock.

Key Indicators

- Acres of suitable range; and
- Animal Unit Months (AUMs) of livestock grazing.

Methodology and Analysis Process

The analysis area for range is the NFS lands of the IPNF, particularly the range allotments.

The NFMA of 1976 requires the identification of the suitability of lands for resource management. An analysis to determine lands suitable to produce forage for grazing animals (suitable for rangelands) was completed as part of the Forest Plan revision. Although an area may be deemed suitable for use by livestock in the Forest Plan, a project-level analysis evaluating the site-specific impacts of the grazing activity, in conformance with NEPA, is required in order to authorize livestock grazing on specific allotment(s).

The assessment of suitable rangelands was accomplished using GIS. Use of GIS resulted in consistent identification of each step in determining suitability. This process is described in detail in appendix B.

Affected Environment (Existing Condition)

Livestock grazing has long been a historic use of the Forest and was being used to meet the needs of the area's inhabitants prior to the creation of the IPNF. For example, settlers utilized horses to work their farms and as a means of transportation, while cattle provided them with beef, milk, and butter.

Livestock grazing has long been a historic use of the Forest and was being used to meet the needs of the area's inhabitants prior to the creation of the IPNF. For example, settlers utilized horses to work their farms and as a means of transportation, while cattle provided them with beef, milk, and butter. However, limited grazing lands and insufficient hay supplies needed for wintering large numbers of animals hindered the livestock production on NFS lands.

Settlers living near NFS boundaries could obtain a free use permit to graze up to ten domestic animals on government land during the specified season. In addition, ranchers could graze larger numbers of animals on NFS lands, providing they purchased a permit, confined their animals to the allotted area, and salted them according to established guidelines.

In 1979, there were 73 allotments on the IPNF. The majority of utilized forage was produced on 7,500 acres of meadow and permanent grasslands. Allotment boundaries included about 100,000 acres of timber land. A few allotments were comprised of only secondary timbered range (transitory). Most of the allotments included private, industry, and NFS lands. The 1987 IPNF Forest Plan projected permitted livestock use to be 6,700 AUMs.

Actual use for cattle grazing on the IPNF has been declining with an average of 3,086 AUMs for the fourteen-year period 1996 through 2009 (refer to figure 57, below). This decline in actual use can be attributed to the following: the re-growth of trees on transitory range; changing patterns of private land use; and scattered small IPNF allotments that prevent continued economic use due to prohibitive trucking and herding costs. Figure 57, below, displays actual use AUMs from the Forest since the 1987 IPNF Forest Plan went into effect.

There have been many changes to allotments over the past several decades. There are now 14 allotments on the Forest. This combined with other factors (e.g., reduction in the number of full time ranchers, property subdivision, and market prices) has reduced the number of AUMs to approximately 2,375 in 2009. Figure 57 displays the actual use AUMs from the Forest since the 1987 IPNF Forest Plan went into effect. The average actual use for the past 10 years (1999 through 2009) was at 5,092 AUMs or 40 percent of the 1987 Forest Plan projected use.

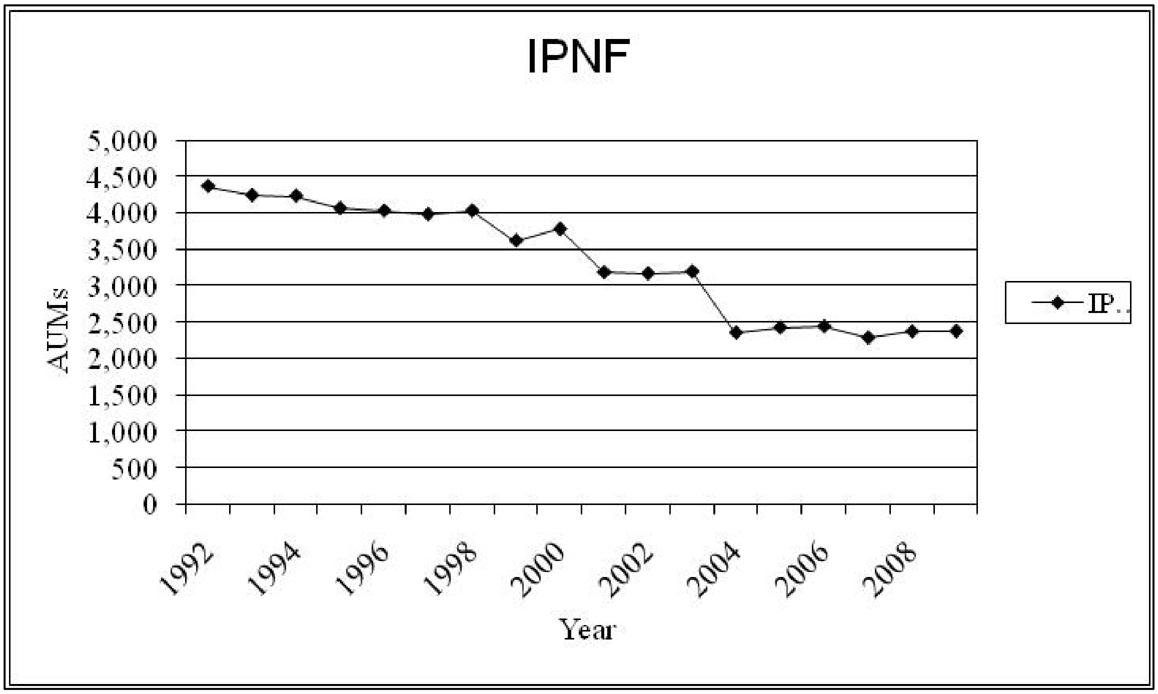


Figure 57. Grazing Use on the Idaho Panhandle National Forest

A rangeland suitability analysis was completed for the Forest Plan and EIS. The suitability determination provides basic information regarding the potential of the land to produce forage in a sustainable manner for livestock and wildlife without damage to the soil and water resources.

The suitability analysis began with a review of the capability of the land to produce forage. Capability was primarily based on soil types capable of producing forage. The analysis then determined the suitability for grazing based on lands capable of producing forage and management decisions. Areas not suitable for grazing were identified based on other resource concerns (e.g., riparian areas), density of forested lands precluding forage production, accessibility to forage (e.g., fenced areas), and allowable uses by MA. Private land within allotments was not analyzed for suitability and would be considered only at the allotment management plan level if there is a permit request. See appendix B for more information on the process used in determining rangeland suitability.

The rangeland suitability analysis identified 365,700 acres capable of grazing on the IPNF. Within existing allotments, there are 39,150 acres capable of grazing. There are approximately 18,316 acres on the IPNF that are suitable for livestock grazing. This represents about 1 percent of the IPNF.

Acres of suitability for rangeland by allotment are displayed in table 163. All acres were generated by a GIS and may not exactly match actual allotment acres. Even though some allotments contain very small amounts of suitable acres, grazing may still be occurring based on site-specific conditions not covered in this strategic analysis of suitability. Therefore, changes to suitability may occur at the project-scale, using site-specific data.

Table 163. IPNF Allotments – Suitability Determination and Status, Existing Condition

Allotment	Status	Allotment Acres	Capable Acres	Percent Capable	Suitable Acres	Percent Suitable
Catspur	active	5,196	924	18%	292	6%
Charlie Creek	active	14,992	1,956	13%	787	5%
Cow Creek	active	8,379	2,989	36%	2,024	24%
Emerald Creek	active	26,353	8,855	34%	2,700	10%
Four Corners	active	2,177	1,034	47%	394	18%
Granite Creek	inactive	1,446	1,446	100%	1,434	99%
Grass Creek	active	5,949	1,557	26%	916	15%
Hayden Creek	active	15,391	1,932	13%	1,047	7%
Iron-Mokins	active	49,339	3,473	7%	1,567	3%
Lamb Creek	active	6,723	4,925	73%	2,482	37%
Lancaster	active	115	26	23%	22	19%
Merry Creek Cooperative	active	44,489	4,458	10%	1,148	3%
Moores Creek	active	3,163	1,994	63%	819	26%
Searchlight Alder Marie	active	15,123	3,582	24%	2,685	18%
Total		**198,834**	**39,150**	**20%**	**18,316**	**9%**

Environmental Consequences

General Effects

Each alternative allows for slightly different levels of expected permitted livestock numbers. Grazing use is managed similarly in all alternatives. The forestwide standards and guidelines are designed to protect both upland and riparian resources in all alternatives. Effects are expected to be consistent between all alternatives. Based on recent trends identified through monitoring reports, AUMs would not be expected to change from existing condition under all alternatives.

Under Alternative A, grazing would generally[1] be allowed under all MAs except: 14, 17, 18, and 19. Grazing is an allowable use in MA2 and 3, 11, 12 but no new allotments are allowed.

Existing allotments would not change by action alternative. Under Alternatives B Modified, C, and D, desired conditions for grazing (FW-DC-GRZ-01 through 03) would be the same. Grazing[2] as an allowable use for MA2, 3 (Special Areas for Geologic, and Emerald Creek), 5, and 6, would not vary by alternative. It is not considered an allowable use for the other MAs, nor are there any existing allotments within these MAs.

[1] See the 1987 Forest Plan for specifics related to grazing for each management area.
[2] As discussed in the Glossary, the term Grazing refers to livestock grazing in permitted allotments only. It does not address uses such as the incidental grazing by pack-stock during recreational pursuits.

Considering environmental consequences and alternative MA allocations, rangeland suitability was determined for each action alternative (table 164). All alternatives would have basically the same acreage of suitable rangeland.

Because suitable rangelands are similar for all alternatives, the amount of AUMs produced from lands is not expected to vary by alternative. Current use levels are expected to continue for the 10 to 15 years at approximately 2,300 AUMs.

Table 164. Range capability and Suitability by Allotment and Alternative B Modified, C, and D

Allotment	Status	Acres	Capable	% Capable	Suitable Alt B Modified	% Suitable Alt B Modified	Suitable Alt C	% Suitable Alt C	Suitable Alt D	% Suitable Alt D
Catspur	active	5,196	924	18%	292	6%	292	6%	292	6%
Charlie Creek	active	14,992	1,956	13%	786	5%	786	5%	786	5%
Cow Creek	active	8,379	2,989	36%	2,024	24%	2,024	24%	2,024	24%
Emerald Creek	active	26,353	8,855	34%	2,700	10%	2,700	10%	2,700	10%
Four Corners	active	2,177	1,034	47%	394	18%	394	18%	394	18%
Granite Creek	inactive	1,446	1,446	100%	1,434	99%	1,434	99%	1,434	99%
Grass Creek	active	5,949	1,557	26%	916	15%	916	15%	916	15%
Hayden Creek	active	15,391	1,932	13%	1,047	7%	1,047	7%	1,047	7%
Iron-Mokins	active	49,339	3,473	7%	1,547	3%	1,547	3%	1,547	3%
Lamb Creek	active	6,723	4,925	73%	2,480	37%	2,480	37%	2,480	37%
Lancaster	active	115	26	23%	22	19%	22	19%	22	19%
Merry Creek Cooperative	active	44,489	4,458	10%	1,148	3%	1,148	3%	1,148	3%
Moores Creek	active	3,163	1,994	63%	819	26%	819	26%	819	26%
Searchlight Alder Marie	active	15,123	3,582	24%	2,685	18%	2,685	18%	2,685	18%
Total		**198,834**	**39,150**	**20%**	**18,292**	**9%**	**18,292**	**9%**	**18,293**	**9%**

Consequences to Livestock Grazing from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Aquatic Resources Management

Under all alternatives, management and protection of riparian areas and wetlands are emphasized. The objectives and standards for the protection of the aquatic resources, particularly riparian areas, have had some of the greatest impact on the forest grazing program. Over the last 10 to 15 years much has been accomplished through altering grazing practices to protect aquatic resources. This occurred on the IPNF through implementation of INFISH standards.

Effects from Access and Recreation

The impact to livestock grazing from recreation and travel management is mainly limited by the grazing permit holder's ability for vehicle access to the allotment. Motorized vehicle access into areas allocated for non-motorized settings can be authorized by line officers. These decisions are discretionary and are made on a case-by-case review of the proposal and circumstances. The intent of the non-motorized areas is not to prevent allotment management. Some of the motorized vehicle access needs include transportation of fence and/or water development materials, noxious weed control, and salt distribution. During particular times of the year, or as some routes "grow in" from lack of use or maintenance; vehicle access may be more restrictive than what is currently available.

Of the action alternatives, Alternatives B Modified and D would allow for the greatest percent of wheeled motor vehicle use (91 percent) and mechanized use (93 percent) across the IPNF. Alternative C would allow the least amount of wheeled motor vehicle use (85 percent) and mechanized use (87 percent). Opportunities for these types of uses could increase recreational use, which may complicate livestock management and make it more expensive. For example, more gates may be left open and livestock are inadvertently or purposely moved.

There is no effect on livestock grazing from winter recreation and winter travel management activities since very little grazing takes place during this time period. This is common for all alternatives.

Range improvements could generally receive less disturbance and vandalism with vehicles restricted to designated roads and trails; however, permit holders would need more time to obtain prior authorization to travel off roads or trails in their allotment. Management effectiveness decreases with fewer motorized opportunities for them to observe stock, check fences and water developments, distribute salt, etc.

Since there are no new developed recreation areas proposed in any alternative the effects of developed recreation on livestock grazing would be the same for each alternative. All of the action alternatives provide for improved trail and road systems, which will reduce conflicts between forest visitors and livestock grazing. The differences of effects to livestock grazing between alternatives are minimal.

Effects from Timber Harvest

Timber harvest can provide increased forage that can be made available for livestock and wildlife grazing. As timber is harvested, it may open up areas to livestock that were not available before. While AUMs are not expected to increase, as this is transitory range and will gradually be replaced by forested cover types, the newly available areas can reduce grazing pressure on other ranges. Under a constrained budget, Alternative B Modified would have the most acres with regeneration harvest (about 1,670 acres), followed by Alternative D (1,660 acres), Alternative A (about 1,470 acres) and Alternative C (about 1,200 acres). Looking at an unconstrained budget scenario, Alternative C would have the least acres with regeneration harvest (about 4,940 acres), followed by Alternative B Modified (5,210 acres), Alternative D (6,100 acres), and Alternative A (approximately 6,900 acres).

Effects from Vegetation Management

Vegetation management opportunities would be things such as conifer encroachment, acres available for use of natural, unplanned ignitions to meet resource objectives, and acres of suitable timberlands.

Management practices to trend toward desired future conditions for vegetation will rely on a variety of passive and active management techniques. Alternative C would place more emphasis on passive management than any of the other alternatives. Alternative C would treat the most acres for vegetation condition for a constrained budget than any of the other alternatives. In Alternative C it can be expected that more treatments under this alternative would rely on prescribed fire and the use of natural, unplanned ignitions than in the other alternatives. Both Alternatives C and D have about 25 percent of land allocations in MA5, which is less than for Alternative B Modified. Wildfire will continue to be an influence on the forest. Larger fires are usually in remote areas of dense timber and can sometimes occur at the edge of allotments. The IPNF wouldn’t expect much of an increase in forage for livestock, but would expect increased forage for big game. This could reduce competition between big game and livestock for forage.

Cumulative Effects

The analysis area for cumulative effects includes all counties identified for the IPNF, including lands administered by the BLM, and the state of Idaho adjacent to the IPNF, and the communities which depend on livestock production from public lands. Protection of threatened or endangered species habitat may have the largest influence on livestock grazing on federal lands. Some permit holders could be severely affected if conditions on their federal allotment require a substantial reduction. At this time, predicting any future reductions are outside the scope of this analysis, but would be addressed with an analysis if additional species are listed.

Grazing on private land depends on the market, drought conditions, and needs of the owner. There would likely be a net loss of forage, and in some cases, loss of big-game winter and spring range, as ranches are sold and subdivided. One scenario that could occur on ranches adjacent to this Forest is that they could be sub-divided and sold as home sites. These conditions could likely continue to occur in the short-term for the counties that the IPNF lay within. As a result, marginal winter habitat may be used more frequently by big game and may increase localized competition between livestock and wildlife on private lands.

Special Forest Products

Introduction

Special forest and botanical products are mainly plant and fungi materials that are gathered from NFS lands for personal use, for commercial resale, or for sale as a craft product. They can generally be categorized under five general areas: residential comfort and use, food, herbs and medicinal, decorative, and specialty items. As demand for these special products increases and new markets are created, harvest pressure on them may increase.

Legal and Administrative Framework

Code of Federal Regulations (CFR)

- **36 CFR 223.1:** Trees, portions of trees, and other forest products on NFS lands may be sold for the purpose of achieving the policies set forth in the Multiple Use Sustained Yield Act as amended and the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended.
- **36 CFR 223.239 and .240 Sale and Disposal of National Forest System Timber, Special Forest Products, and Forest Botanical Products:** Section 223.239 provides regulations for free-use without a permit for members of tribes with treaty or other reserved rights related to special forest products. Also free-use without a permit upon the request of the governing body of a tribe. Section 223.240 provides regulations regarding harvest of special forest products by tribes with treaty or other reserved rights.
- **36 CFR 261.6:** Lists activities regarding timber and other products that are prohibited.

Key Indicator

- Management area allocation.

Methodology and Analysis Process

The analysis included a review of rules and regulations for special forest and botanical products and effects based on MA allocation for each alternative. Management areas with more access allow for increased supply of special forest products and the potential for over-harvest.

Analysis Area

The analysis area is the NFS lands within the IPNF boundaries.

Affected Environment (Existing Condition)

Special forest and botanical products include plant and fungal material that may be collected from NFS lands. Special forest and botanical products include, but are not limited to, mosses, fungi (including mushrooms), bryophytes, roots, bulbs, berries, seeds, wildflowers, forbs, sedges, grasses, nuts, ferns, tree sap, boughs, bark, cones, burls, transplants, pine straw, Christmas trees, firewood, posts and poles, mine props, and rails. These products are available through commercial harvest and sale and through free use. Historically, the Forest has granted commercial and free use of special forest and botanical products to individuals and tribes with treaty and other reserved rights.

Special forest and botanical products may be collected forestwide, unless an area has been closed for a specific reason. Existing uses are often tied to historical knowledge and patterns of use. The most popular special forest and botanical products on the Forest include huckleberries, firewood, Christmas trees, and boughs. Mushroom picking is a popular activity following wildfires. In recent years, requests from the general public for commercial and free use collection of special forest and botanical products have increased.

Special forest and botanical products have importance to the tribes as traditional and cultural uses. As per current handbook direction (2409.18, section 87.13), the IPNF considers "treaty rights, customary and traditional uses (including subsistence and other historical uses of plant material by tribes), the federal trust responsibility to tribes, and competitive market demands in determining which products would be excluded from or allowed for sale to commercial harvesters. When there is a shortage of any particular special forest product for tribal use, commercial permits will be issued only to the extent that the tribal use can be accommodated."

The IPNF consults and coordinates with tribal governments prior to issuing any permits, contracts, or other authorized instrument when there is a possible impact to tribal treaty and other rights and interests in the permitted or contracted area (handbook direction 2409.18, section 87.18). The IPNF honors the unique legal relationship, including the trust relationship, between the federal government and Indian tribal governments.

The supply of desired products is dependent on ecological conditions and existing distributions of potential habitat. Forest management can increase the supply of certain products. The opening of stands, timber harvest, and prescribed burning can increase huckleberry production in those habitats supporting this species. Thinning and regeneration harvest can also increase production of Christmas trees. Firewood is often a by-product of a commercial timber harvest.

Environmental Consequences

General Effects

Special forest and botanical products may be collected for personal use forestwide except in some special areas (botanical special areas) and RNAs. Commercial use of special forest and botanical products is not allowed in designated wilderness; recommended wilderness; wilderness study area; wild, scenic and recreational rivers; special areas; or RNAs.

Table 165 displays the acres by MA where commercial use of special forest and botanical products is not allowed. Alternative C has the most acres and Alternative A the least acres where commercial use of these products is not allowed. Acres not allowed for personal use remain constant for all action alternatives. Alternative A has the least acres where personal use is not allowed.

Table 165. Acres of Management Areas where Commercial Use of Special Forest and Botanical Products is Not Allowed by Alternative

Management Area		Alt A	Alt B Modified	Alt C	Alt D
MA1a	Wilderness	153,900	9,900	9,900	9,900
MA1b	Recommended Wilderness		130,100	318,500	128,800
MA1c	Wilderness Study Areas		6,900	6,900	6,900
MA1e	Primitive Lands		19,800	0	11,200
MA2a	Wild and Scenic Rivers	29,100	21,300	21,400	21,400
MA2b	Eligible Wild and Scenic Rivers		49,900	42,200	48,400

Management Area		Alt A	Alt B Modified	Alt C	Alt D
MA3	Botanical, Geological, Pioneer, Recreational, or Scenic Areas [1]	6,800	13,500	13,200	35,400
MA4a	Research Natural Areas [2]	18,100	14,800	14,100	14,100
MA4b	Experimental Forests		8,200	8,200	8,200
Total		**207,100**	**296,400**	**434,400**	**284,300**

[1] Personal use also not allowed in botanical special areas

[2] Personal use also not allowed in this MA

The requests for and use of special forest and botanical products will continue to increase regardless of the alternative, although the allowable collection of them, access to them, and habitat conditions will vary. Alternative D provides the most areas with allowable use, the most access, and the most management activities to improve habitat conditions for special forest and botanical products.

Consequences to Special Forest Products from Forest Plan Components Associated with other Resource Programs or Revision Topics

Effects from Access

The opportunity for collecting special forest and botanical products is affected by the amount of motorized access to the Forest. Areas with no motorized access limit opportunities and reduce the ability to collect products. Alternative C has the most non-motorized access; thus, reduced opportunities for use. Alternative D has the most motorized access; thus, the best opportunities for use.

Effects from Fire

Fire increases the potential availability of some special botanical products, such as mushrooms and huckleberries. The amount of wildfire is not expected to change by alternative. Prescribed fire is expected to be highest under Alternative C; thus, the best potential habitat for some botanical products.

Effects from Timber

Timber harvest increases the potential availability of some special botanical products, such as huckleberries. Opening the stand increases the amount of sun, improving conditions for growing huckleberries and other shrubs. The amount of timber harvest is the highest under Alternative D, providing the best conditions for huckleberry growth. Alternative D would also provide the most commercial timber harvest, providing for more firewood cutting.

Cumulative Effects

The West has been the fastest growing region in the country, and this trend is expected to continue for the next 20 years (U.S. Census 2000 data and projections). With this increased growth rate comes an increased use of special forest and botanical resources. The sustainable use of these resources may become increasingly vulnerable, requiring permitting and limitation of use.

The increased population also results in increased housing density on lands adjacent to the IPNF. This increased housing density leads to fragmented landscapes and degradation of habitat for some special botanical species. The increased housing density also limits access for commercial or personal use of special forest and botanical products.

Social and Economic Environment

Introduction

National forests are public lands that influence and are influenced by local and national publics. Local publics are represented in the communities of place and interest adjacent to national forest lands. Many of these communities were formed from the development of timber, gold, silver, grazing lands, and other natural resources. Historically, individuals in these communities developed strong place attachments to public lands that provided recreational, aesthetic, employment, and other contributions to their social environment. Work, place, and lifestyles became an integral part of the culture and social characteristics of such communities. These communities developed particular interests in the interactions of public lands with their ways of life and their economic present and future. These interests are expressed in their interactions with public lands in addition to the actions and comments of local interest groups.

National publics also have interests and concerns about public lands in general as well as particular public lands such as those of the IPNF. These interests are expressed in public comments to management actions as well as in direct experiences recreating, visiting, or otherwise using public lands. Some of these publics also express their interest through national organizations with both broad-based concerns about the management of public lands and in specific resources such as old growth forests, grizzly bears, or other threatened and endangered species. Thus, they are part of the social environment of public lands through the values and beliefs that motivate actions about particular places and by their comments and actions related to these places.

Legal and Administrative Framework

Law and Executive Orders

- **Multiple-Use Sustained Yield Act of 1960:** Identifies principles for managing the resources of the NFS. The direction to manage these resources for the greatest good over time includes the use of economic and social analysis to determine management of the NFS.
- **National Environmental Policy Act of 1969:** Mandates consideration of the consequences to the quality of the human environment from proposed management actions. The agency must examine the potential impacts to physical and biological resources as well as potential socioeconomic impacts (40 CFR 1508.14).
- **Forest and Rangeland Renewable Resources Planning Act of 1974:** As amended by the NFMA of 1976, requires consideration of potential economic consequences of land management planning.
- **Office of Management and Budget Circular A-116 (issued August 16, 1978):** Requires executive branch agencies to conduct long range planning and impact analysis associated with major initiatives.
- **Executive Order No. 12898 on Environmental Justice (issued February 11, 1994):** Mandates federal agencies to make achieving environmental justice part of their mission. This includes identification and response to disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.
- **National Forest Revenue Act (amended 1908):** Requires 25 percent of revenues generated by NFS lands to be paid to the States for use by the counties in which the lands are situated for the benefit of public schools and roads.

- **Secure Rural Schools and Community Self-Determination Act of 2000:** Was designed to stabilize annual payments to state and counties containing NFS lands and public domain lands managed by the BLM. Funds distributed under the provisions of this act are for the benefit of public schools, roads, and related purposes.

Regulation and Policy

- **1982 Planning Rule Procedures:** The procedures of the 1982 NFS Land and Resource Management Planning Rule requires the comprehensive consideration of economic benefits and costs, specifically identifying the social impacts, economic considerations, cost-efficient alternatives, impacts on present net value, and impacts on local employment.

Key Indicators

Social Indicators

- Population demographics;
- Land ownership and use;
- Lifestyle, attitude, values and beliefs; and
- Communities and change.

Economic Indicators

- Change in number of jobs;
- Change in income;
- Federal payments to counties; and
- Present Net Value.

Methodology and Analysis Process

A social assessment was completed to “assess public perceptions, values, attitudes, behaviors, lifestyles, community characteristics, and other sociocultural factors that affect the interaction of nearby communities with the natural resources of the IPNF.” Analysis was conducted by sociologists. Primary data was collected using a discussion guide with an open-ended format. Participants were selected based on a diversity of perspectives and knowledge of the local communities. Findings were summarized in the document *Social Assessment for the Idaho Panhandle National Forests – Final Report* by Parker, Wulfhorst, and Kamm 2002.

An assessment of social conditions and trends for the planning zone was also completed. This document compiled findings of the social assessment for the IPNF as well as social assessments that had been completed for the KNF with demographic data for the planning area. This document also presented data and information for a larger, regional area outside the forest boundaries. Findings were presented in the document *Conditions and Trends: Social and Economic Systems for the Kootenai and Idaho Panhandle Plan Revision Zone* by Russell et al. 2006.

Various data sources were used to describe population, land ownership, employment, income, and county payments. These data sources include U.S. Census, the Bureau of Economic Analysis, Bureau of Labor Statistics, Montana Natural Resource Information, and the Economic Profile System – Human Dimensions Toolkit.

National forest contributions to employment and income and changes by alternative were estimated with input-output analysis using the IMPLAN (IMpact analysis for PLANning) modeling system (Minnesota IMPLAN Group (MIG) 2003) and Forest Economic Analysis Spreadsheet Tool (Alward et al. 2010). The IMPLAN modeling system allows the user to build regional economic models of one or more counties for a particular year. The model for this analysis used the 2008 IMPLAN data. The Forest economic analysis spreadsheet tool (FEAST) is a spreadsheet modeling tool that serves as an interface between user inputs and imported data from an existing IMPLAN model.

Input-output analysis is a means of examining relationships within an economy, both between businesses and between businesses and final consumers. It captures all monetary market transactions for consumption in a given time period. Economic contribution analysis is defined as “the gross change in economic activity associated with an industry, event, or policy in an existing regional economy (Watson et al. 2007). By using Forest Service expenditure data, resource output data, and other economic information, IMPLAN can describe, among other things, the jobs and income that are supported by NFS management activities. The direct employment and labor income benefit employees and their families, and therefore, directly affect the local economy. Additional indirect and induced, multiplier effects (ripple effects) are generated by the direct activities. Together the direct and multiplier effects comprise the total economic contribution to the local economy. The data used to estimate the direct effects from timber harvest is information provided by University of Montana’s Bureau of Business and Economic Research. The economic effects tied to other Forest Service programs and the multiplier effects were estimated using IMPLAN. Resource specific data (recreation visits, range head months, timber volume harvested, etc.) were collected and input into the IMPLAN and FEAST models. For current management levels, a three-year average using 2007 – 2009 data was calculated for resources to eliminate the year to year variability inherent in the data.

Present net value was calculated using a spreadsheet (MS-Excel) and estimated costs and values for goods and services for each alternative. Present net value combines benefits and costs that occur at different times and discounts them into an amount that is equivalent to all economic activity in a single year. Costs and values for anticipated activities, goods, and services over the next 50 years for each alternative were derived by resource specialists.

Analysis Area

The IPNF contain portions of ten counties in three states: (see table 166 and figure 58). As shown in table 166, more than 90 percent of the IPNF are located within Bonner, Boundary, Kootenai, and Shoshone counties in Idaho. Shoshone County contains the highest acreage of national forest land, with 69 percent of the county administered by the IPNF.

The analysis area for the social and economic environment is comprised of counties within a zone of influence for IPNF management. Counties were selected based on the concept of a functional economy (Johnson 1995). Counties were also selected based on the potential impact IPNF management may have on local communities. Information used to assist in the delineation consisted of 1) component economic areas as defined by the Bureau of Economic Analysis, 2) recent log-flow information from the IPNF provided by the University of Montana’s Bureau of Business and Economic Research, and 3) personal communications with regional office and forest-level staffs. The resulting social and economic analysis area is comprised of Benewah, Bonner, Boundary, Kootenai, and Shoshone counties in Idaho.

Table 166. Counties within the Analysis Area: Acreage and Percent Administered by IPNF

County	Total County Acres	Total FS Acres	% of County FS Acres	Acres Admin. by IPNF	% of County Admin. by IPNF
Benewah County, ID	496,600	35,300	7%	25,500	5%
Bonner County, ID	1,227,600	472,600	38%	432,800	35%
Boundary County, ID	817,300	490,800	60%	478,000	58%
Clearwater County, ID	1,575,400	802,400	51%	3,000	<1%
Kootenai County, ID	796,900	243,500	31%	243,500	31%
Latah County, ID	689,100	112,800	16%	12,700	2%
Shoshone County, ID	1,685,800	1,199,000	71%	1,155,600	69%
Lincoln County, MT	2,351,000	1,753,600	75%	22,800	1%
Sanders County, MT	1,785,100	921,300	52%	7,300	<1%
Pend Oreille County, WA	911,700	574,100	63%	118,400	13%

Source: Idaho: County Profiles of Idaho, 2001; Montana: Montana Natural Resource Information System; Washington: Russell et al. 2006.

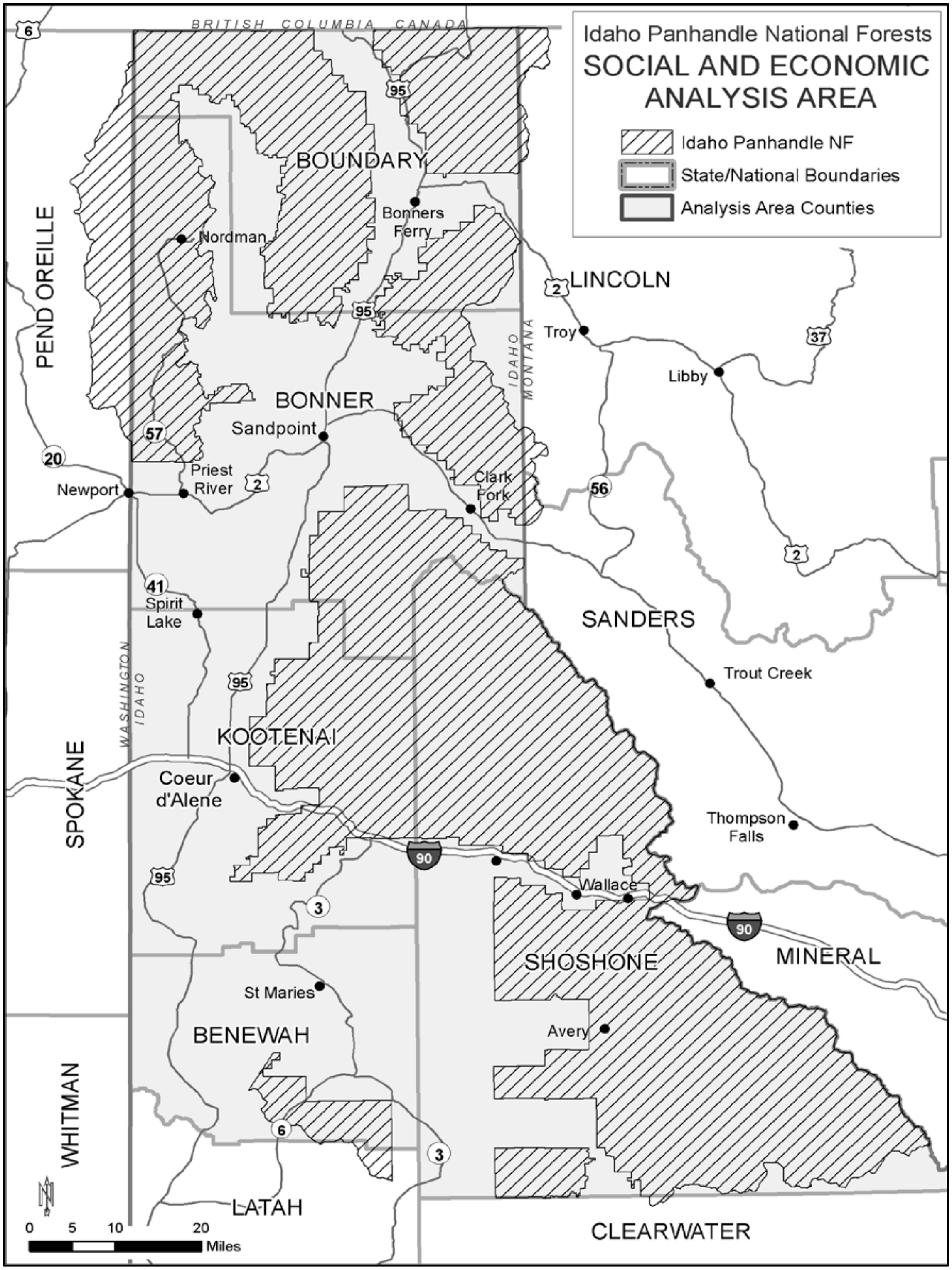


Figure 58. Counties in the Analysis Area

Regional Economy

The social and economic environment is influenced by a larger, regional economy. The regional economy will not be described in this EIS. Only the counties directly impacted by management of the IPNF are included in the analysis areas. This larger regional economy for the IPNF is described in the document *Conditions and Trends: Social and Economic Systems for the Kootenai and Idaho Panhandle Plan Revision Zone* by Russell et al. 2006.

Changes between Draft and Final

Analysis was updated between draft and final to reflect the predicted timber volume sold found in the FEIS. See the "Timber" section for a description of the changes in predicted timber volume sold in the FEIS. This resulted in an update to the jobs and income figures, present net value, and present value of benefits.

The "Wildland Economic Dependency" section was revised to reflect recent updates to this analysis. See this section for a description of these updates.

Affected Environment (Existing Condition)

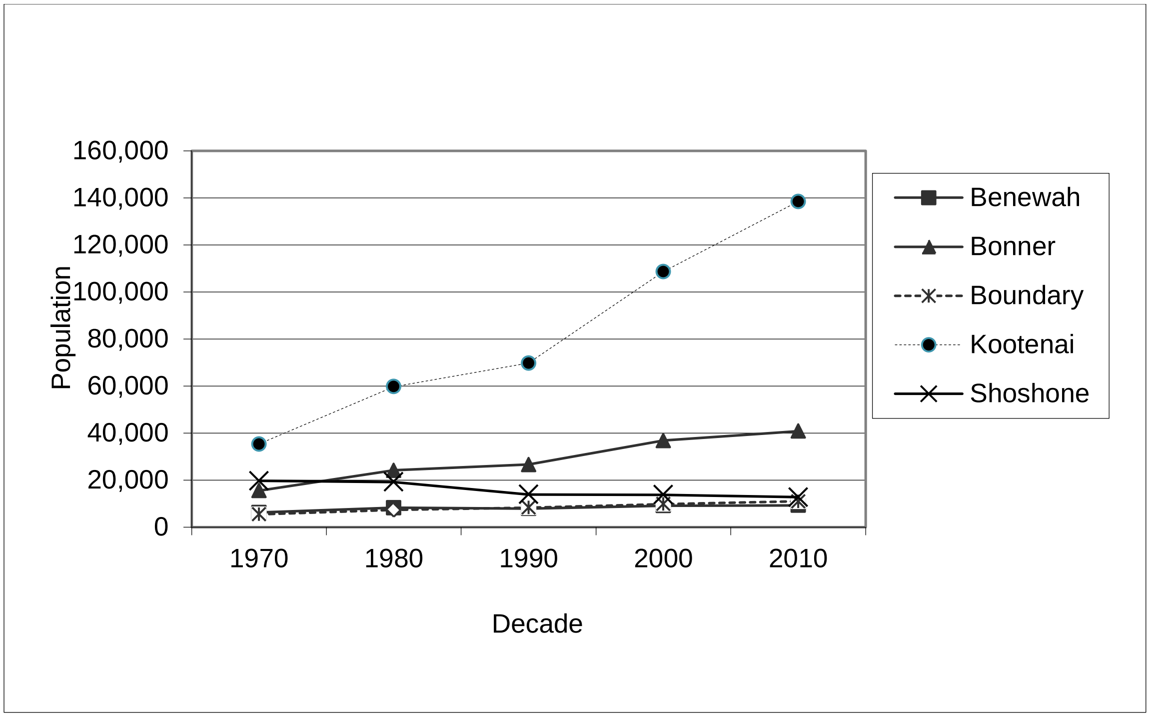
Population Demographics

The population of all five counties except Shoshone increased from 1980 to 2010 (see table 167 and figure 59). The growth rates in Kootenai and Bonner Counties exceed those of the state, while Benewah and Boundary Counties are growing at a slower rate. The population in Shoshone County was decreasing. Kootenai County experienced the most growth and Shoshone County the least growth from 2000 to 2010.

Table 167. Change in Population by County and State

Region	1980	1990	2000	2010	Percent Change (1980-2010)
Idaho State	947,983	1,006,749	1,293,953	1,567,582	65.4%
Benewah County	8,292	7,937	9,171	9,285	12.0%
Bonner, County	24,163	26,622	36,835	40,877	69.2%
Boundary County	7,289	8,332	9,871	10,972	50.5%
Kootenai County	59,770	69,795	108,685	138,494	131.7%
Shoshone County	19,226	13,931	13,771	12,765	-33.6%

Source: U.S. Bureau of the Census



Source: U.S. Bureau of the Census

Figure 59. Population by County by Decade

The growth in population experienced by Kootenai County is reflective of the increasing development and economic diversification of Coeur d'Alene, Idaho, and its close proximity to the major trade center and urban area of Spokane, Washington. Bonner County is also seeing a significant increase in population, also due to close proximity to Coeur d'Alene and Spokane.

All counties saw an increase in median age from 2000 to 2010. In 2010, the median age for Benewah was 44.8, Bonner 45.8, Boundary 42.8, Kootenai 38.9, and Shoshone 46.2. This is consistent with the overall aging of the population in the United States, which had a median age of 37.2. All counties have a higher median age than the national average.

The ethnic compositions of all counties is fairly homogenous and predominantly white (see table 168), with Bonner County having the highest percentage (96.0 percent) and Benewah County the lowest percentage (86.6 percent). Within all counties, American Indian is the next largest ethnic group (for a single race), with Benewah County having the highest percentage (8.7 percent) and Bonner County the lowest percentage (0.1 percent).

Table 168. Population by Race, 2010

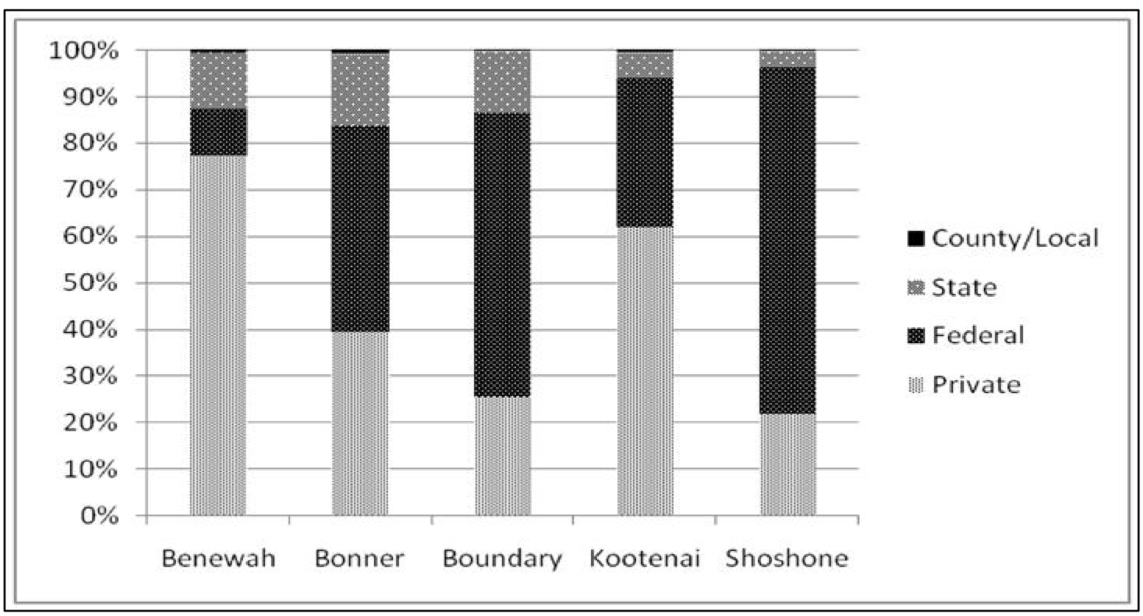
	Benewah County	Bonner County	Boundary County	Kootenai County	Shoshone County
Total Population	9,285	40,877	10,972	138,494	12,765
White alone	8,039	39,261	10,398	130,844	12,174
Black or African American alone	28	58	29	416	26
American Indian alone	809	315	189	1,781	183
Asian alone	27	182	62	961	47

	Benewah County	Bonner County	Boundary County	Kootenai County	Shoshone County
Native Hawaiian & Other Pacific Is. alone	6	42	6	129	12
Some other race	44	163	58	1,041	68
Two or more races	332	854	230	3,322	255
Percent of Total					
White alone	86.6%	96.0%	94.8%	94.5%	95.4%
Black or African American alone	0.3%	0.1%	0.3%	0.3%	0.2%
American Indian alone	8.7%	0.8%	1.7%	1.3%	1.4%
Asian alone	0.3%	0.4%	0.6%	0.7%	0.4%
Native Hawaiian & Other Pacific Is. alone	0.1%	0.1%	0.1%	0.1%	0.1%
Some other race	0.5%	0.4%	0.5%	0.8%	0.5%
Two or more races	3.6%	2.1%	2.1%	2.4%	2.0%

Source: U.S. Bureau of the Census

Land Ownership and Use

Many counties in the western United States contain a large amount of federal land and are influenced by management actions on these public lands. Within the analysis area, Shoshone and Boundary counties have the largest percentage of land under federal ownership at 74 and 61 percent respectively. Bonner County has the next largest at 44 percent. Kootenai County is 32 percent federally owned. Benewah County has the least amount of federally owned land, at 10 percent. For all counties, most of the federal ownership is NFS lands. Benewah County has the largest percentage under tribal ownership, at 44 percent. Figure 60 displays the percent by land ownership for each county (tribal ownership is included in the private land figures).



Source: Idaho County Profiles

Figure 60. Percent Land Ownership by County

Traditionally, the five counties in the analysis area have relied on the use of natural resources in activities such as farming, ranching, mining, and timber production. Recreation has also been an important use of forest resources among the residents of nearby communities as well as others from more distant urban areas such as Spokane, Missoula, and elsewhere. The institution of the Forest Service has also been a part of the social environment of communities in this region since development of the NFS.

The five counties in the analysis area are noted for their natural resources. The counties are heavily forested, ranging from 78 percent (Benewah County) to 95 percent (Shoshone County) forestland. Timber harvest has been an important land use for all five counties.

The water resources of the area have had a significant influence, carving the river valleys that provide the major areas for settlement. The many rivers, lakes, reservoirs and streams also provide fishing and recreation opportunities to local residents and draw visitors to the area.

In addition, the area has a wide array of wildlife: including moose, elk, white-tail deer, black bears, grizzly bears, caribou, wolves, lynx, coyotes, bird life, and a variety of fish species (please see the “Wildlife” and “Aquatics” sections for additional information). Therefore, hunting and fishing have had a large influence on settlement of the area and remains a major activity for local residents and visitors to the area.

Many of the visitors to the Forest are from other States and Canada. Through their expenditures, this influx of visitors provides an important source of local jobs and income.

Mining has had an important influence on the history and settlement of the area. The Coeur d’Alene Mining District, incorporating the Silver Valley communities of Kellogg and Wallace, produced gold, silver, lead and zinc that was shipped to Anaconda and Spokane for processing. From the later part of 1800s through the Second World War and into the 1980s, mining continued to be part of the economic and social structure of several northern Idaho and western Montana communities.

Since the early 1980s mining has declined in places such as the Silver Valley and in parts of western Montana. There are over 600 abandoned mines on the IPNF alone and there are also active mines or operating plans on all IPNF ranger districts. Communities such as Kellogg, Idaho, and other communities in the historic Silver Valley of Shoshone County, Idaho have experienced mine closures. Currently, there are continuing operations for silver and lead at several Silver Valley mines as well as industrial garnet mining in Benewah County near Fernwood.

Ranching and agriculture have traditionally been important uses of land. Benewah and Kootenai have the greatest amount of land in agriculture (15 percent), while Shoshone County has the least (less than 1 percent). Grazing of livestock has been a historic use of the Forests but at relatively low levels, given the amount of heavily forested lands.

For more information on historic and current trends in land uses in the five counties, see the document *Conditions and Trends: Social and Economic Systems for the Kootenai and Idaho Panhandle Plan Revision Zone* by (Russell et al. 2006).

Lifestyle, Attitude, Values, and Beliefs

A social assessment was completed for the IPNF (Parker et al. 2002), encompassing communities within Boundary, Bonner, Kootenai, Benewah, and Shoshone counties in Idaho.

Social assessments were also completed for the KNF, encompassing neighboring Lincoln and Sanders counties in Montana (Russell & Adams-Russell 2003 and Russell & Downs 1995). These studies included information on lifestyles, values, and issues regarding forest management. The following summarizes the findings from these studies (excerpted from Russell et al. 2006):

- Communities have a strong rural identity and value rural lifestyles. The values about rural communities include:
  - Face-to-face interpersonal relationships and knowing neighbors.
  - Personal safety and living in what is perceived to be a low-crime region in which family and children are safe.
  - Volunteerism that supports community enrichment and ways of life.
  - Mutual support for neighbors and other community members in times of need.
  - Opportunity for self-reliance and the exercise of personal freedom.
  - Preference for limited government regulation and other influence on the lifestyles and property rights of individuals.
  - The importance of the "local place" as a reference for assessing what is meaningful and valued.
- Lifestyles vary, but there are some common characteristics:
  - Individuals choose to live in these communities because of the lifestyle and benefits offered.
  - This choice often entails an economic compromise because of limited job opportunities and other means to make a living.
  - This is compensated for by the aesthetic, scenic, and open space resources of rural areas close to public lands. This results in a strong sense of place attachment.
  - Occupations have traditionally focused on resource extraction such as logging, log truck driving, mill work, equipment repair, mining, farming, and ranching. These occupations have structured the activity patterns and interactions with natural resources for many community members.
  - Individual and community identities are based on the occupational lifestyles of resource extraction such as logging, mining, and mill work.
  - Hunting, fishing, berry gathering, wildlife viewing, trail riding, and other outdoor activities are important activities valued by residents as accessible away from work activities.
  - Hunting is an especially important characteristic of local lifestyles. It has some direct economic benefit in providing food resources, but it also expresses the fundamental values of self-reliance and engagement with and appreciation of the natural world
  - Attending church and participation in school activities, especially athletic events, are common activities expressing support for community.
- National forest lands and resources are evaluated as important local resources that contribute to the quality of lifestyles in the region. The Forest Service and the public lands they manage are perceived as providing a range of benefits to local communities, including the following.
  - The agency contributes leadership, organizational, facility, and other resources to communities. Agency personnel also participate as community members in clubs, organizations, volunteer efforts, and other elements of community life.

- Recreational opportunities are an important perceived benefit of forest lands. Individuals and groups with diverse recreational interests value the available opportunities to pursue outdoor activities close to their residence and place of work.
- Open space is also a significant value for residents who see forest lands as integral to the qualities of community and place of this region. Open space contributes to the rural character of communities.
- Economic value exists in the resources that can be extracted from public lands (e.g., minerals, timber, and other plant material) and in the scenic, amenity, and recreational resources that attract tourists. Among some interest groups there is strong sentiment the national forest management is inhibiting community development by limiting timber harvests, which is believed to result in fewer jobs in local communities.
- Fiscal benefits accrue to counties from Payments in Lieu of Taxes, funds from the Secure Rural Schools and Self-Determination Act of 2000, timber tax, and other federal payments related to public lands. These fiscal benefits often offset taxes that would otherwise be required to provide funding for schools, roads, and other state and local government programs.
- Existence benefits are associated with special places (e.g., wilderness and roadless areas) and resources (e.g., grizzly bear) as well as with the Forest as a whole. For example, providing habitat for diverse plants and wildlife and ecological conditions that contribute to water quality.

The integration of community, place, work, recreation, and lifestyle characterizes the social environment of this region. Occupationally-based identities for individuals and communities express the history and traditions of logging, mining, mill work, and agriculture. These identities also incorporate values about the use of, and the attachment to, natural resources that enrich rural lifestyles and the opportunity to express personal freedom.

Communities and Change

Change characterizes the communities within the analysis area. An important source of change is the decline of the wood products and mining industries and associated businesses. Other sources of change include new residents, especially retirees and seasonal home owners, whose values and lifestyles are not always the same as those of longer-term residents. Retirees and other newcomers are sometimes perceived as demanding services and having “preservationist” values that favor limiting resource extraction from public lands. This increasing diversity of views and lifestyles is perceived to be altering the rural character of communities and personal freedom valued by longer-term residents. This in-migration has the positive result of generating jobs and income associated with new residents.

The Social and Economic Conditions and Trends document (Russell et al. 2006) defined and described six “community ideal types,” based on categories that linked the communities to forest management (see pages 50 – 57). These categories included geographic proximity, economic, social, and cultural (values and lifestyles) criteria that link communities to forested lands and resources. Communities were then categorized by these six ideal types and current affects from forest management described.

Native American Communities — These communities will continue to have strong ties to forest management through political, economic, social, and cultural linkages.

Urban Regional Centers — These communities are tied to forest management primarily through recreational use and the existence and amenity values of nearby national forest(s).

Commodity Communities — These communities are tied to forest management through commodity production or processing. Forest management under the alternatives is expected to continue to provide wood fiber, grazing, and minerals close to current levels.

Transition Communities — These communities are tied to forest management through the production of both commodities and recreation values.

Diversity Communities — These communities are tied to Forest management primarily through recreation, sense of place (aesthetics and place meanings and values), and access to forested lands.

Rural Forest Communities — These communities are tied to forest management through the production of commodities, recreation, place, and lifestyle. This type of community has similar linkages to forest management as commodity and transition communities.

The Social and Economic Conditions and Trends document also included a table with a suggested categorization of communities within the study area. Table 169 lists those communities from Russell et al. (2006) that are within the planning area.

Table 169. Planning Area Communities by Ideal Type

Place	Community Ideal Type
Benewah County, ID	
Plummer, Benewah	Native American
St. Maries	Commodity
Tensed	Rural Forest
Bonner County, ID	
Clark Fork	Rural Forest
Dover	Diversity
East Hope	Rural Forest
Kootenai	Diversity
Oldtown	Transition
Ponderay	Diversity
Priest River	Transition
Sandpoint	Diversity
Boundary County, ID	
Bonners Ferry	Transition
Moyie Springs	Rural Forest
Kootenai County, ID	
Athol	Rural Forest
Coeur ‘d Alene	Diversity
Dalton Gardens	Diversity
Fernan Lake Village	Diversity

Place	Community Ideal Type
Harrison	Rural Forest
Hauser	Diversity
Hayden	Diversity
Hayden Lake	Diversity
Post Falls	Diversity
Rathdrum	Transition
Spirit Lake	Transition
Worley	Rural Forest/Native American
Shoshone County, ID	
Kellogg	Transition/Commodity
Mullan	Commodity
Osburn	Commodity
Pinehurst	Transition
Smelterville	Transition
Wallace	Commodity
Wardner	Transition
Associated Communities Outside of the Study Area	
Newport, WA	Transition
Spokane, WA	Urban Regional Center
Moscow, ID	Urban Regional Center
Missoula, MT	Urban Regional Center

Source: Russell et al. 2006

Employment and Income

Employment by industry describes the distribution of jobs by economic sector. The Bureau of Economic Analysis maintains and updates these data. The most current information (for the year 2008) uses the North American Industry Classification System. This classification system has been used since 2001. Table 170 displays employment by industry for 2001 and 2008.

The percent of proprietor employment increased in all five counties from 2001 to 2008 and is significantly higher than found for the entire U.S., which was 21.3 percent in 2008. Bonner County had the highest percentage in proprietor employment (39.5 percent) and Shoshone County the lowest (24.2 percent) in 2008.

In all counties except Bonner, the Government sector was one of the top employers in 2001 and 2008. For Bonner County, the Government sector was in the top three employers in both years. All counties except Benewah saw a decline in the percentage of employment in Government from 2001 to 2008. Benewah had a slight increase in Government employment from 2001 to 2008. In 2008, Benewah, Boundary, and Shoshone counties were above the percent of Government employment for the entire U.S. (13.5 percent), while the remaining two counties were below the national figure.

Retail trade is also a top employer in all five counties. Retail trade fell from 2001 to 2008 in Bonner and Kootenai while increasing in the remaining three counties. All counties except Bonner County saw a decline in manufacturing employment from 2001 to 2008.

Table 170. Employment by Industry, 2001 and 2008

	Benewah		Bonner		Boundary		Kootenai		Shoshone	
	2001	2008	2001	2008	2001	2008	2001	2008	2001	2008
Employment by Place of Work										
Total Employment	4,982	5,338	20,258	25,272	5,021	5,810	60,543	79,741	5,729	6,843
By Type (percent of total employment)										
Wage and salary employment	75.5%	71.4%	64.7%	60.5%	70.7%	66.5%	77.0%	74.8%	78.3%	75.6%
Proprietors employment	24.5%	28.6%	35.3%	39.5%	29.3%	33.5%	23.0%	25.2%	21.7%	24.4%
By Industry (percent of total										
Farm employment	5.8%	5.7%	3.1%	2.8%	8.1%	9.4%	1.4%	1.0%	0.9%	0.5%
Non-farm employment	94.2%	94.3%	96.9%	97.2%	91.9%	90.6%	98.6%	99.0%	99.1%	99.5%
Private employment	70.9%	68.7%	85.1%	87.2%	70.4%	70.9%	84.0%	85.8%	78.9%	83.5%
Forestry, fishing, related activities, and other	(D)	(D)	3.9%	2.7%	6.7%	(D)	1.3%	1.0%	2.0%	1.7%
Mining	(D)	(D)	0.6%	0.9%	0.2%	(D)	0.3%	0.5%	9.0%	10.8%
Utilities	0.2%	0.4%	(D)	0.5%	(D)	0.2%	0.4%	0.4%	(D)	(D)
Construction	4.1%	5.5%	10.4%	11.5%	6.9%	10.4%	9.1%	10.5%	5.7%	6.9%
Manufacturing	13.0%	12.6%	9.3%	9.9%	9.9%	6.0%	7.0%	6.1%	4.6%	4.3%
Wholesale trade	8.3%	1.0%	(D)	1.4%	1.3%	0.9%	2.3%	2.4%	(D)	(D)
Retail trade	6.7%	10.1%	16.0%	13.7%	10.9%	11.5%	14.1%	12.9%	15.5%	17.3%
Transportation and warehousing	6.7%	6.6%	2.3%	2.0%	3.5%	3.4%	1.6%	1.6%	2.9%	4.1%
Information	0.9%	0.7%	1.2%	1.2%	0.9%	0.7%	2.2%	1.7%	1.2%	1.0%
Finance and insurance	1.6%	1.4%	2.9%	3.0%	1.0%	2.1%	3.8%	4.4%	2.1%	1.8%
Real estate and rental and leasing	1.9%	2.9%	4.5%	7.6%	(D)	3.6%	4.0%	6.0%	(D)	5.4%
Professional and technical services	2.9%	2.0%	5.1%	5.6%	3.8%	3.9%	4.6%	5.4%	4.5%	4.3%
Management of companies and enterprises	(D)	0.0%	0.3%	(D)	0.0%	0.0%	0.4%	0.4%	0.0%	(D)
Administrative and waste services	(D)	1.7%	2.3%	(D)	1.7%	3.3%	7.4%	6.0%	(D)	(D)
Educational services	(D)	(D)	1.3%	1.1%	1.1%	1.8%	0.7%	1.0%	0.7%	0.7%
Health care and social assistance	(D)	(D)	6.2%	6.0%	11.2%	8.6%	8.4%	8.8%	7.9%	6.5%
Arts, entertainment, and recreation	(D)	0.9%	3.9%	3.6%	0.9%	0.8%	2.9%	3.0%	1.6%	1.8%
Accommodation and food services	(D)	3.0%	6.5%	6.3%	3.3%	2.5%	8.2%	8.8%	8.1%	6.9%
Other services, except public	7.2%	5.6%	6.6%	6.6%	4.6%	5.0%	5.1%	4.9%	5.5%	5.5%
Government and gov't. enterprises	23.2%	25.7%	11.7%	10.0%	21.4%	19.7%	14.6%	13.2%	20.2%	15.9%

	Benewah		Bonner		Boundary		Kootenai		Shoshone	
	2001	2008	2001	2008	2001	2008	2001	2008	2001	2008
Federal, civilian	1.5%	1.3%	1.3%	0.8%	2.5%	2.6%	1.1%	0.7%	1.9%	1.3%
Military	0.7%	0.7%	0.7%	0.6%	0.8%	0.8%	0.7%	0.7%	0.9%	0.7%
State and local	21.0%	23.7%	9.7%	8.6%	18.1%	16.3%	12.7%	11.8%	17.4%	13.9%

(D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals

Source: Bureau of Economic Analysis website http://www.bea.gov/regional/reis/ , table CA25

The Bureau of Labor Statistics maintains information about annual unemployment rates for counties, states, and regions. These data are a consistent and comparable source of information about county unemployment rates, although they do not include information about some data, such as discouraged workers. Average annual unemployment data for a 14 year period (figure 61) indicates that all counties show higher than average annual unemployment rates when compared to state rates. Benewah, Shoshone, and Boundary counties have the highest unemployment rates while Kootenai and Bonner are lower.

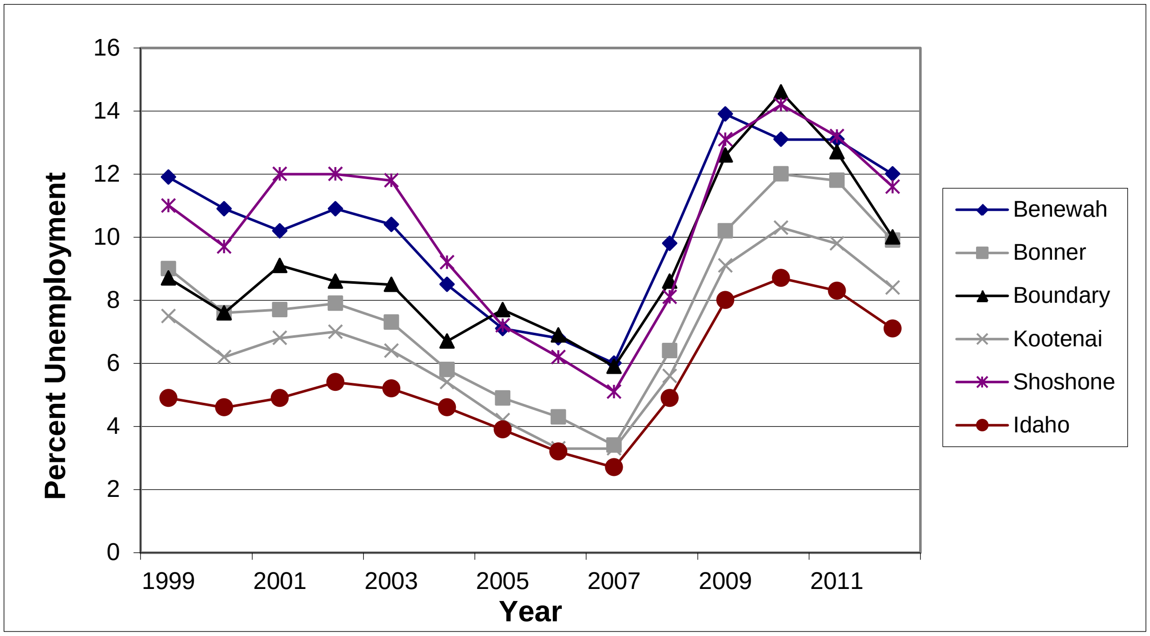
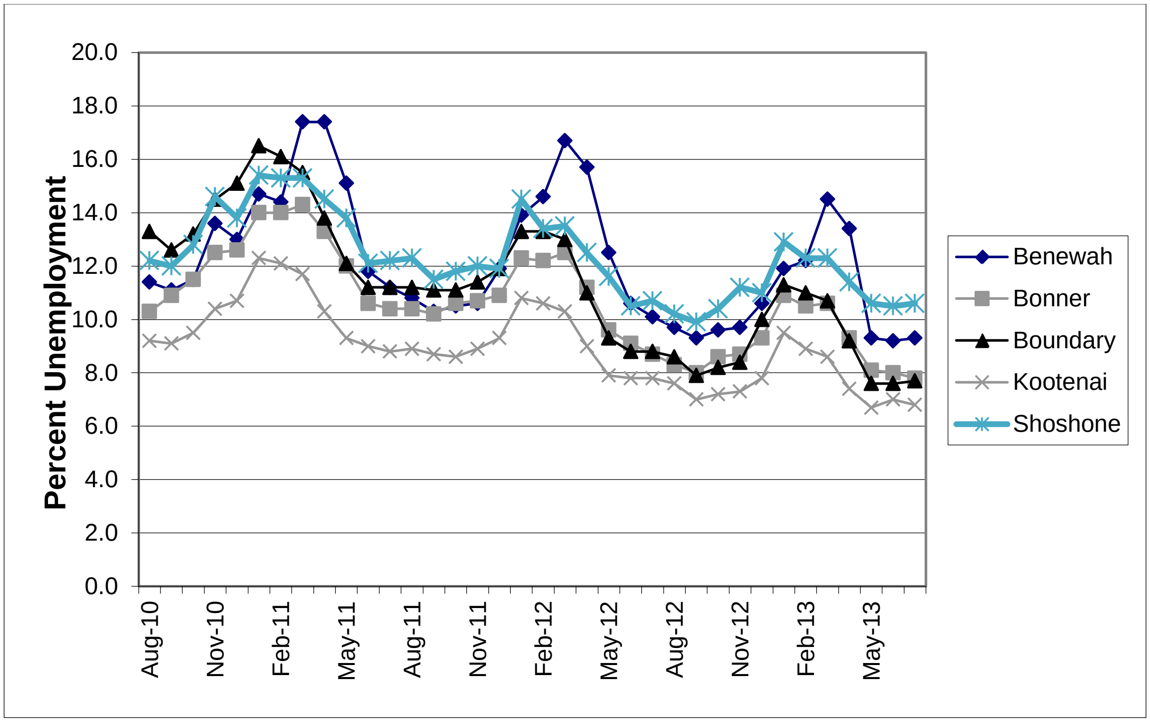


Figure 61. Percent Unemployment by County

Unemployment has a strong seasonal pattern among the counties as indicated in figure 62. As the chart shows, around March unemployment begins to drop and continues to drop until about September. The highest months of unemployment are from November through April. These seasonal variations are probably related to jobs in construction, agriculture, and natural resource related employment.



Source: Bureau of Labor Statistics at http://www.bls.gov/lau

Figure 62. Percent Unemployment by Month by County

The per capita income by county and state is displayed in table 171. All five counties are below the state's average per capita income. In 2008, Kootenai County had the highest and Boundary County the lowest per capita income. All five counties and the state were below the national per capita income level of $40,166 in 2008. Benewah County experienced the highest average annual growth in per capita income from 1998 to 2008, exceeding the state average and the national average (4.0 percent). Bonner and Boundary Counties have the lowest average annual growth in per capita income from 1998 to 2008.

Table 171. Per Capita Income by County and State

County/State	1998 Per Capita Income	2008 Per Capita Income	1998 – 2008 Average Annual Growth Rate
Benewah County	$18,870	$30,697	5.0%
Bonner County	$18,938	$31,127	3.8%
Boundary County	$16,728	$24,382	3.8%
Kootenai County	$22,014	$32,279	3.9%
Shoshone County	$19,489	$30,806	4.7%
Idaho State	$22,234	$32,944	4.0%

Source: U.S. Department of Commerce, Bureau of Economic Analysis
website http://www.bea.gov/bea/regional/bearfacts

Income by industry describes the distribution of earning among the categories of employment used by the Bureau of Economic Analysis. Table 172 displays the percentage of income generated by major industries in 2001 and 2008.

Table 172. Compensation by Industry, 2001 and 2008

	Benewah		Bonner		Boundary		Kootenai		Shoshone	
	2001	2008	2001	2008	2001	2008	2001	2008	2001	2008
Earnings by Place of Work										
Total Earnings (thousands of dollars)	123,326	162,187	370,991	605,381	101,403	148,794	1,436,338	2,376,910	133,184	211,842
By Industry (percent of total earnings)										
Farm earnings	1.2%	0.8%	0.3%	0.3%	2.7%	6.3%	0.1%	0.1%	0.0%	0.0%
Nonfarm earnings	98.8%	99.2%	99.7%	99.7%	97.3%	93.7%	99.9%	99.9%	100.0%	100.0%
Private earnings	66.5%	62.2%	77.8%	80.0%	63.8%	59.7%	77.4%	78.3%	70.6%	78.1%
Forestry, fishing, related activities, and other	(D)	(D)	2.8%	1.4%	6.4%	(D)	1.1%	0.7%	1.1%	1.4%
Mining	(D)	(D)	1.0%	1.3%	0.0%	(D)	0.6%	1.0%	18.8%	25.2%
Utilities	0.3%	0.4%	(D)	1.8%	(D)	0.1%	1.2%	1.0%	4.2%	(D)
Construction	2.6%	3.3%	7.2%	8.1%	3.9%	7.7%	9.3%	10.6%	5.2%	5.5%
Manufacturing	20.2%	22.1%	15.7%	15.9%	16.3%	8.6%	11.5%	9.9%	9.4%	5.0%
Wholesale trade	0.8%	1.2%	(D)	1.9%	1.5%	1.7%	3.5%	3.6%	(D)	(D)
Retail trade	5.2%	6.0%	17.9%	18.5%	8.4%	9.9%	11.7%	11.1%	15.1%	17.1%
Transportation and warehousing	10.4%	10.0%	2.7%	1.9%	4.0%	4.0%	1.3%	1.2%	1.5%	2.7%
Information	0.7%	0.7%	1.6%	1.3%	0.5%	0.3%	3.0%	2.2%	1.3%	0.9%
Finance and insurance	1.0%	0.8%	3.7%	3.7%	0.8%	2.5%	4.5%	5.4%	1.4%	1.1%
Real estate and rental and leasing	0.1%	0.2%	0.8%	1.2%	(D)	0.5%	1.2%	1.5%	0.0%	0.8%
Professional and technical services	3.7%	1.0%	3.8%	4.6%	4.3%	3.1%	4.1%	5.3%	4.7%	3.4%
Management of companies and enterprises	(D)	0.0%	0.5%	(D)	0.0%	0.0%	1.6%	1.3%	0.0%	(D)
Administrative and waste services	(D)	0.3%	0.7%	(D)	0.6%	1.5%	5.3%	4.1%	(D)	(D)
Educational services	(D)	(D)	1.1%	0.8%	0.9%	1.8%	0.4%	0.6%	0.5%	0.4%
Health care and social assistance	(D)	(D)	5.7%	6.0%	12.6%	9.1%	8.2%	9.7%	5.8%	5.3%

	Benewah		Bonner		Boundary		Kootenai		Shoshone	
	2001	2008	2001	2008	2001	2008	2001	2008	2001	2008
Arts, entertainment, and recreation	(D)	0.1%	2.2%	2.5%	0.1%	0.2%	1.4%	1.8%	0.6%	0.7%
Accommodation and food services	(D)	0.9%	3.4%	3.5%	1.3%	1.0%	4.8%	5.1%	3.0%	2.7%
Other services, except public admin.	3.8%	2.4%	3.4%	3.5%	1.7%	2.3%	2.6%	2.4%	2.5%	2.2%
Government and gov't. enterprises	32.3%	37.0%	22.0%	19.6%	33.5%	34.0%	22.5%	21.6%	29.4%	21.9%
Federal, civilian	3.3%	2.8%	3.9%	2.6%	7.8%	9.7%	2.9%	2.1%	4.5%	2.9%
Military	0.5%	1.0%	0.7%	1.1%	0.6%	1.2%	0.5%	1.0%	0.6%	1.0%
State and local	28.5%	33.2%	17.4%	15.9%	25.0%	21.3%	19.2%	18.5%	24.3%	18.0%

(D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals

Source: Bureau of Economic Analysis website http://www.bea.gov/regional/reis/ , table CA06

Several of these industries connect local economies to national forests. For example, Farm Earnings may include income from individuals with grazing permits and the forestry, fishing and related activities industry, as well as manufacturing, may include earnings from persons in the wood processing industry. Retail and wholesale trade, accommodations, and arts and entertainment include earnings from persons who provide services to tourists as well as to local residents. U.S. Forest Service earnings are captured in the Government and Government Enterprises industry.

Table 172 shows that Government generates the largest portion of income in all counties. The manufacturing industry, which includes wood processing mills and facilities, was the second or third highest contributor of private earnings in all counties except Shoshone in 2001. By 2008, manufacturing's contribution had decreased in Boundary and Kootenai counties and was no longer in their top three industries for earnings. Mining is the second highest contributor to private earnings in Shoshone County in both 2001 and 2008. Collectively, sectors associated with tourism (retail and whole sale trade, accommodations and food services, arts and entertainment) are also among the important contributors to private earnings in Bonner, Kootenai, and Shoshone counties. The percentage of earnings in these industries typically increased in all five counties from 2001 to 2008.

Wildland Economic Dependency

The National Forest-Dependent Rural Communities Economic Diversification Act of 1990 (Public Law 101-624) defined a county as being wildland dependent if 15 percent or more of their total county labor income (primary and secondary income) came from industries associated with forest resources. Primary income is income derived directly from the industrial sectors constituting the primary wildland industries and secondary income is that derived from indirect and induced effects associated with primary income (the multiplier effect) (Gebert and Odell 2007). Economic dependency on wildland natural resources can be assessed by estimating the proportion of primary and secondary labor income generated in natural resource industries relative to the labor income for all industries. A reliable source of county-level labor income data by industry is found in the IMPLAN input-output modeling system. Primary (direct) labor income is defined as the sum of employee compensation and proprietor income. Secondary labor income is calculated by using an IMPLAN Type II labor income multiplier that includes "indirect" and "induced" effects derived from primary labor income. Total labor income effects are the sum of primary plus secondary labor income.

Natural resource (or wildland) dependency was measured for the following industries: 1) grazing, 2) timber, 3) mining, 4) wildland federal government management (e.g., Forest Service and BLM employment, etc.), and 5) recreation expenditures tied to recreation activity occurring on all private and public wildland (Gebert and Odell 2007).

Table 173 shows wildland economic dependency by county based on the relationship of labor income generated by the natural resource industries to total labor income. The table indicates the total wildland dependency is highest in Benewah County (34.3 percent) and lowest in Kootenai and Bonner counties. Timber is the largest contributor to wildland income in Benewah, Bonner, and Boundary counties. Mining is the largest contributor in Shoshone and Kootenai counties. Grazing, Recreation, and Wildland Government are small contributors in all counties.

The wildland dependency numbers have been updated using data from 2010. The DEIS displayed numbers from 2000. The updated numbers show a drop in wildland dependency for all counties, though the decrease was much more substantial for some counties than for others.

Some of this is due to the change in the economy in some counties, such as sawmill closures. However, another reason for the change in dependency numbers is because of the multipliers used to compute the secondary impacts. In the earlier study, multi-county impact areas, called component economic areas (labor areas defined by the Bureau of Economic analysis), were purchased from MIG (Micro-IMPLAN Group located in Stillwater, MN). Therefore, each county in the multi-county impact areas had the same multipliers. When the dependency calculations were redone, county-level impact models were ran, allowing for county- and sector-specific multipliers to be calculated. This was not possible in the earlier 2000 analysis due to computing limitations. Multipliers for a larger geographical area (for example, a state or multi-county area) are generally larger than those for a smaller area (for example, a county). Larger geographical areas generally have a greater capacity to re-spend primary (direct) income, the multiplier effect, than do smaller areas. A larger portion of the primary income received by smaller units is commonly spent in areas outside the county for goods and services, a process called "leakage." However, despite these changes, three of the five counties in the analysis area (all but Bonner and Kootenai counties) derive more than 15 percent of their total county labor income from wildland-based sectors in the economy.

Table 173. Wildland Dependency – Total Labor Income by Category (2010 data)

County	% Total Non-Wildland	% Grazing	% Timber	% Mining	% Wildland Government	% Recreation
Benewah	65.7%	0.2%	29.5%	2.4%	2.1%	0.1%
Bonner	87.2%	0.2%	7.4%	3.2%	1.7%	0.4%
Boundary	78.4%	1.1%	16.3%	0.6%	2.6%	1.1%
Kootenai	91.8%	0.1%	3.3%	3.6%	1.0%	0.1%
Shoshone	66.2%	0.2%	2.1%	27.5%	1.6%	2.5%

Source: Results from Gebert and Odell 2010 data set (Gebert and Odell 2007, updated 2012)

Economic Contribution of the National Forests to the Economic Study Area

Management of national forests contributes to the local economies by the products (e.g., timber, minerals, etc.) that are produced on the national forests and processed in the local economy; by uses (e.g., recreation visits, etc.) that occur on the national forests; and by the service provided by employees of the national forests. This analysis is similar to the wildland dependency analysis with the exception that only Forest Service related products, uses, and services are considered.

An IMPLAN input-output model was constructed to estimate the economic contribution of the national forests to the analysis area economy. The IMPLAN model was constructed using 2008 IMPLAN data (the most recent IMPLAN data available).

The results for the contribution analysis for the IPNF are displayed in table 174, which shows employment and labor income for the analysis area (columns labeled "Area Totals") and the employment and labor income attributable to Forest Service related activities (columns labeled "FS-Related"). The results indicate there are approximately 1,380 full- and part-time jobs and $54 million in labor income in the study area attributable to the IPNF activities. This is 1.2 percent of the employment and 1.3 percent of the labor income of the study area economy. The products, uses, and services of the IPNF have its largest effect in the government sector with 483 (35 percent) of the 1,382 jobs and $26 million (48 percent) of the $54.5 million labor income. The five sectors with the most employment attributable to IPNF activities are government;

accommodations and food services; retail trade; forestry and related activities; manufacturing and health care (tied for fifth place). For labor income, the top five sectors are government; manufacturing; accommodations and food services; forestry and related activities; and retail trade.

The dependency analysis presented earlier indicated that some of the counties in the study area were highly dependent on wildland activities, with the total impact area showing 12 percent dependency on wildland-based industries. The analysis of jobs and income attributable to IPNF activities indicates there is only a small portion (just over 1 percent) of the study area jobs and income generated by Forest Service activities. The contributions results suggest that the wildland-dependent activities are tied to non-Forest Service lands.

Table 174. Current Role of the IPNF-Related Contribution to the Area Economy

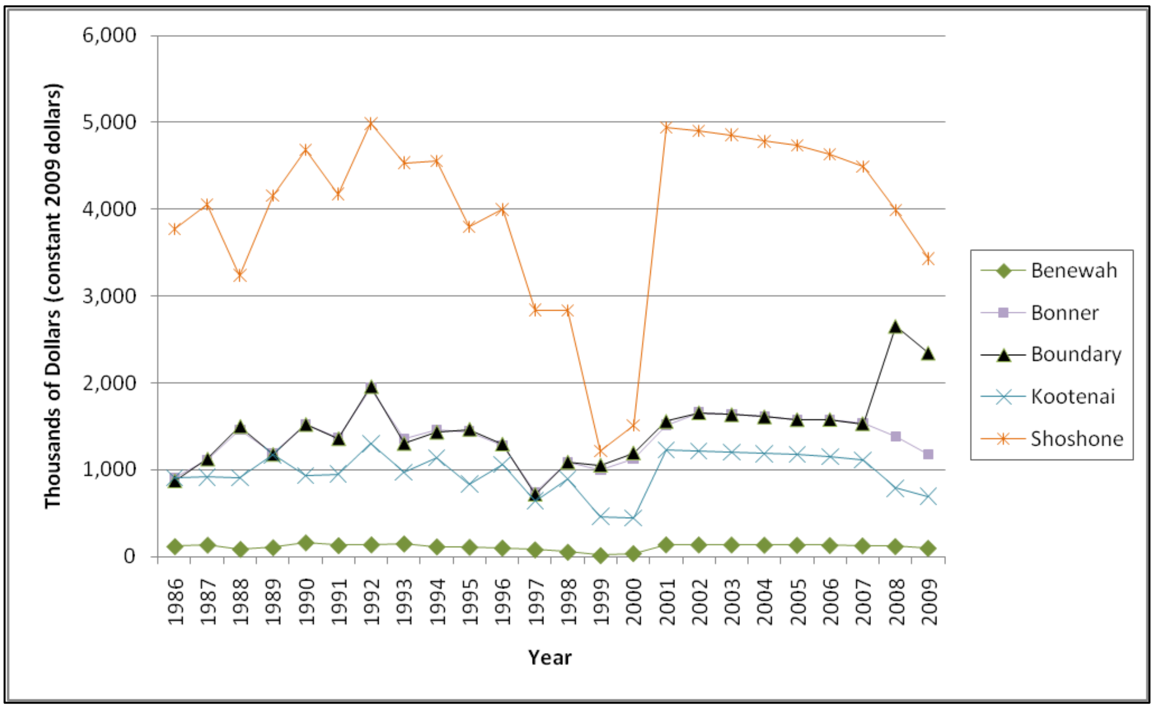
	Employment (jobs)		Labor Income (Thousands of 2009 dollars)	
Industry	**Area Totals**	**FS-Related**	**Area Totals**	**FS-Related**
Forestry, fishing, related activities, other	3,750	85	$153,112	$3,125
Mining	1,138	3	$92,714	$138
Utilities	425	3	$40,134	$356
Construction	11,672	58	$425,591	$2,322
Manufacturing	8,298	72	$412,742	$3,912
Wholesale Trade	2,163	27	$113,601	$1,402
Retail Trade	15,789	108	$481,331	$3,014
Transportation & Warehousing	2,620	24	$94,076	$856
Information	1,660	12	$68,387	$487
Finance & Insurance	3,210	20	$167,657	$1,051
Real Estate & Rental & Leasing	6,144	47	$87,190	$654
Prof, Scientific, & Tech Services	4,525	35	$261,589	$1,970
Management of Companies	396	3	$34,752	$239
Admin, Waste Mgmt & Rem Serv	4,214	29	$106,757	$740
Educational Services	1,291	8	$21,885	$138
Health Care & Social Assistance	10,032	72	$365,618	$2,556
Arts, Entertainment, and Rec	3,348	35	$78,760	$723
Accommodation & Food Services	8,874	209	$149,457	$3,812
Other Services	6,578	49	$110,053	$860
Government	16,456	483	$798,782	$26,011
Total	**112,582**	**1,382**	**$4,064,188**	**$54,365**
Forest Service as Percent of Total	---	1.2%	---	1.3%

Payments to Counties

Counties containing NFS lands receive payments from the federal government to compensate for critical services they provide to both county residents and visitors to these federal lands. Congress enacted in 1908 and subsequently amended a law (the National Forest Revenue Act) that requires that 25 percent of the revenues derived from NFS lands be paid to States for use by the counties in which the lands are situated for the benefit of public schools and roads. Since 1908, the affected counties have received these payments. Under this act, payments to counties changed from year to year due to the fluctuation in volume and revenues generated by timber sales.

The Secure Rural Schools and Community Self-Determination Act (Public Law 106-393) was enacted in October 2000. The purpose of this act was to stabilize payments to counties. Under this law, for fiscal years 2001 through 2006, counties had the choice of receiving either (1) the 25-percent payment as under the Act of 1908 or (2) an amount equal to their proportion of the average of the state's three highest 25-percent payments from fiscal year 1986 through fiscal year 1999. All counties in the planning area chose option 2. The law was extended in 2007 for 1 year. The law was then reauthorized in 2008 with some changes and provides payments through 2011.

Payments to the counties for 1986 to 2009 are shown in figure 63. The graph shows the payments to counties have fluctuated greatly over the last two decades. Payments somewhat stabilized from 2001 to 2007 under the Secure Rural School Act. In the analysis area, Shoshone County has received the highest payments since 1986, with payments substantially higher than the other counties, except in years 1999 and 2000.



Source: U.S. Forest Service at https://fsplaces.fs.fed.us/fsfiles/unit/r4/payments_to_states.nsf

Figure 63. Forest Service Payments by County – 1986 to 2009 (in constant, 2009 dollars)

Counties also receive Payments in Lieu of Taxes. Under the Payments in Lieu of Taxes Act of 1976, Congress provided payments to units of local government, typically counties, containing federal lands. These payments are designed to supplement other federal land receipt sharing payments that local governments may receive. The act authorizes payments under one of two alternatives, with formulas that consider such factors as other forms of revenue sharing, acreage, and population. These payments are made directly to counties and may be used for any purpose. Payments in Lieu of Taxes payments can be and recently have been limited by Congress through the appropriations process. Congress has not appropriated sufficient funds to fund the full payments to counties since 1994. Payments increased in 2008 under the Emergency Economic Stabilization Act of 2008.

Table 175 shows total federal payments to counties for 2009. Kootenai and Shoshone counties received the highest and Benewah County the lowest Payments in Lieu of Taxes payment. Shoshone County has the highest total federal payments.

Table 175. Federal Land Payments to Analysis Area Counties, 2009

	Benewah County	Bonner County	Boundary County	Kootenai County	Shoshone County
Total Federal Land Payments by Geography of Origin ($)	140,007	1,463,137	2,551,205	1,101,432	3,833,193
PILT	41,289	289,913	210,551	404,011	400,335
Forest Service Payments	98,713	1,174,639	2,340,554	693,704	3,432,533
BLM Payments	0	-1,415	100	3,717	325

Source: U.S. Department of Interior, 2009. Payments in Lieu of Taxes (PILT), Washington D.C.; U.S. Department of Agriculture, 2009. Forest Service, Washington, D.C.; U.S. Department of Interior. 2009. Bureau of Land Management, Washington, D.C.

The contribution of federal land payments to county budgets is illustrated in table 176. Shoshone County is the most affected by the payments to government, with more than 33 percent of the county revenues generated by federal land payments. Benewah County is the least affected, with less than 1 percent of their county revenue generated by federal land payments.

Table 176. Federal Land Payments as a Share of Total General Government Revenue, FY2007 (2009 dollars)

	Benewah County	Bonner County	Boundary County	Kootenai County	Shoshone County
Total General Revenue	24,795	35,989	19,726	77,724	8,884
Taxes	2,389	19,609	3,989	32,865	3,432
Intergovernmental Revenue	873	8,337	4,713	20,762	3,985
Total Charges	21,119	5,932	10,556	18,823	908
All Other (Miscellaneous)	413	2,112	468	5,273	559
Federal Land Payments (FY 2006)	98	1,034	1,064	1,025	2,972
Percent of Total					
Taxes	9.6%	54.5%	20.2%	42.3%	36.6%
Intergovernmental Revenue	3.5%	23.2%	23.9%	26.7%	44.9%
Total Charges	85.2%	16.5%	53.5%	24.2%	10.2%
All Other (Miscellaneous)	1.7%	5.9%	2.4%	6.8%	6.3%
Federal Land Payments (FY 2006)	0.4%	2.9%	5.4%	1.3%	33.5%

Source: U.S. Department of Commerce. 2009. Census of Governments Survey of State and Local Government Finances, Washington, D.C.; U.S. Department of Interior, 2006. Payments in Lieu of Taxes (PILT), Washington D.C.; U.S. Department of Agriculture, 2006. Forest Service, Washington, D.C.; U.S. Department of Interior. 2006. Bureau of Land Management, Washington, D.C.

Environmental Consequences

General Effects

The IPNF provide a variety of uses, values, benefits, products, services, and visitor opportunities (termed “outputs and values”). Under all alternatives, these outputs and values will be provided in a sustainable manner, supplying outputs and values for current and future generations. These outputs and values contribute to the sustainability of the social and economic systems within the analysis area.

While the analysis area is affected by the management activities, uses, and outputs of the IPNF, there are also many external factors that affect local counties and communities. These external factors include national and regional population trends, national trade agreements, state and national laws and regulations, technological advances in manufacturing, technological advances in recreation equipment, cultural trends, and changes in societal values. These external factors often have a larger impact on the social and economic environment than does management of the IPNF. This section addresses the potential effects from IPNF management decisions from the alternatives.

Population

Population is not expected to vary by alternative. Current trends are expected to continue over the life of the Plan, with slower population growth in Benewah and Boundary counties, faster growth in Kootenai and Bonner counties, and declining population in Shoshone County.

Land Ownership and Use

Land ownership is not expected to change under any alternative. There may be some land exchanges in the future, but it is not expected to result in any net increase in lands administered by the IPNF. Any future land exchanges or sales would be assessed to determine specific impacts.

Some land uses will vary by alternative. Timber harvest levels vary based on MA allocation and management intensity as determined by the theme of the alternative. See chapter 2 for a description of the alternatives. Total recreation numbers are not expected to change by alternative, but the opportunities and quality of the experiences may vary. Acres and miles available for wheeled motor vehicle use do not change by alternative. Opportunities for over-snow vehicle use vary by alternative. Mining and grazing uses do not change by alternative.

Alternative C has the greatest amount of land in recommended wilderness, with an emphasis on backcountry, non-motorized recreation. This alternative has the least amount of active management, with the lowest timber harvest level. Alternative B Modified has the second highest amount of land in recommended wilderness and non-motorized recreation, with the second lowest timber harvest level. Alternative D has the greatest amount of land in general forest management, with an emphasis on timber harvest and motorized recreation. This alternative has the least amount of recommended wilderness and backcountry uses, with the second highest timber harvest level. Alternative A has the second lowest amount of land in recommended wilderness and the highest timber harvest level and motorized recreation opportunities.

Lifestyles, Attitudes, Values, and Beliefs

The outputs and values provided by the IPNF contribute to the quality of lifestyles found in the planning area. Some of these outputs and values vary by alternative.

For those valuing timber harvest or having a lifestyle that is tied to the logging or manufacturing industries, the alternative with the most timber harvest would add to their quality of life more than those alternatives with lower timber harvest levels. Alternative D provides the highest, Alternatives A and B Modified the next highest levels, while Alternative C provides the lowest amount of timber harvest.

Although total recreation use numbers are not expected to change by alternative, opportunities for specific types of recreation and the quality of the experience will vary based on management allocation and the emphasis of the alternative. For those valuing non-motorized and wilderness recreation, the existence of special places, scenery and open spaces, the alternative with the most recommended wilderness and backcountry MAs would add to their quality of life more than the other alternatives. Alternative C provides the greatest opportunity for these types of values, followed by Alternative B Modified and A. Alternative D provides the least opportunity for these types of values.

For those valuing motorized recreation opportunities, the alternative with the most general forest and motorized backcountry MAs would add to their quality of life more than other alternatives. Alternative D provides the most opportunity for this type of recreation, followed by Alternative A and B Modified. Alternative C provides the least opportunity for this type of recreation.

Communities and Change

As described above, an important source of change in the communities within the analysis area has been a decline in the wood products industries. Alternative D would provide for the most timber harvest, which may help to slow some of this change. Alternative C would provide the least amount of timber harvest; and thus, may result in increased change.

The following is a description of the trends expected under the alternatives for the six community types (as described in the “Affected Environment”):

Native American Communities – Under all alternatives, forest managers are expected to continue to coordinate with and provide for Native American rights and interests.

Urban Regional Centers – Forest management under the alternatives is expected to continue to provide for a variety of recreational opportunities, at or above current levels, as well as other amenities such as scenery and solitude. The types of recreation opportunities vary under alternatives, with Alternative C providing for the greatest amount of non-motorized recreation and least amount of motorized recreation opportunities. Alternative D provides the most motorized recreation and the least amount of non-motorized recreation opportunities. Some decrease in the quality of recreational experiences may occur as populations increase, causing crowding of popular sites. These urban regional centers are expected to continue to expand, diversify, and grow into the future.

Commodity Communities – Forest management under the alternatives is expected to continue to provide wood fiber, grazing, and minerals close to current levels. Alternative D would provide the highest level of commodity production and Alternative C the lowest level. These communities are expected to continue to change as new residents move in, bringing different attitudes, values, and beliefs. This change in community values, beliefs, and identities creates social tension related to resource management issues. These communities are expected to evolve into Transition Communities (described below) as their populations and businesses change.

Transition Communities – Forest management under the alternatives is expected to continue to provide commodities and recreation opportunities close to current levels. Alternative D would provide the highest level of access and commodity production and Alternative C the lowest levels. Access to the Forest will continue to be an issue and source of conflict, with a desire by some for more access, a desire by others for less, and resource concerns limiting management decisions. The ability to increase access opportunities will remain limited under all alternatives. These communities will continue to undergo a great deal of change, as populations and businesses diversify, and economic structures, patterns of use, and values about forest resources change.

Diversity Communities – Forest management under the alternatives is expected to continue to provide a variety of recreational opportunities at or above current levels. The types of recreation opportunities vary under alternatives, with Alternative C providing for the greatest amount of non-motorized recreation and least amount of motorized recreation opportunities. Alternative D provides the most motorized recreation and the least amount of non-motorized recreation opportunities. Access will continue to be a management challenge under the alternatives, with limited or no ability to provide increased opportunities due to other resource concerns. Changes in access may occur to specific areas, roads, or trails. Due to their economic and social diversity, these communities are more easily able to adapt to changing conditions with increased population and forest management than Transition or Commodity communities.

Rural Forest Communities – Outcomes under the alternatives would be similar to Commodity and Transition communities, with commodity and recreation use close to current levels for all alternatives and highest under Alternative D. New residents to these communities will continue to affect change through a diversification of attitudes, values, and beliefs.

Employment and Income

Local employment and income is affected by changes in outputs and uses on the Forest. As described in the “Methodologies” section above, the IMPLAN modeling system was used to estimate changes to jobs and income from expected output and use levels for each alternative. Economic effects were predicted with and without extension of county payments under the Secure Rural Schools and Community Self-Determination Act.

Although the differences between the alternatives in many cases are relatively small, the impacts may be considerable to individuals, families, or businesses. In very small communities, the loss of a single job may be very important, yet negligible across the analysis area.

Table 177 displays the employment and table 178 the income associated with IPNF management for the five-county analysis area by alternative. These tables compare the alternatives to current levels of employment and income.

Table 177. Employment by Program for Current Management and by Alternative (average annual, decade 1)

Resource	Current Mgmt	Alt A	Alt B Modified	Alt C	Alt D
Recreation: non-local only	266	301	301	301	301

Resource	Current Mgmt	Alt A	Alt B Modified	Alt C	Alt D
Wildlife and Fish: non-local only	105	119	119	119	119
Grazing	1	1	1	1	1
Timber	167	471	454	454	465
Minerals	0	0	0	0	0
Payments to States/Counties	164	164	164	164	164
Forest Service Expenditures	678	678	678	678	678
Total Forest Management	1,382	1,735	1,718	1,718	1,729
Percent Change from Current		25.5%	24.3%	24.3%	25.14%

Table 178. Labor Income by Program for Current Management and by Alternative (average annual, decade 1; Thousands of Dollars)

Resource	Current Mgmt	Alt A	Alt B Modified	Alt C	Alt D
Recreation: non-local only	$7,090	$8,011	$8,011	$8,011	$8,011
Wildlife and Fish: non-local only	$2,942	$3,325	$3,325	$3,325	$3,325
Grazing	$20	$20	$20	$20	$20
Timber	$7,556	$21,672	$20,916	$20,916	$21,420
Minerals	$4	$4	$4	$4	$4
Payments to States/Counties	$5,984	$5,984	$5,984	$5,984	$5,984
Forest Service Expenditures	$30,769	$30,769	$30,769	$30,769	$30,769
Total Forest Management	**$54,364**	**$69,785**	**$69,029**	**$69,029**	**$69,533**
Percent Change from Current		28.4%	27.0%	27.0%	27.9%

The largest difference between the alternatives and the current amounts is based on changes to timber. The timber output for current management is an average of the amount that was harvested in fiscal years 2007, 2008, and 2009. Timber harvest during this time period was very low because of poor market conditions following the decline in the housing market. For the alternatives, the timber output is the average annual first decade timber sold as modeled in Spectrum. The timber sold level for the alternatives is similar to the amount of timber sold over the last 5 years. See the “Timber” section in chapter 3 and appendix B for more information on the modeling and results for predicted timber volume sold.

Recreation, wildlife, and fish outputs are constant for all alternatives. Levels are expected to increase by 13 percent over current levels based on expected population growth over the next 10 years in the western U.S. (2000 U.S. Census data, Population Projections table 6).

Grazing and minerals are constant for current management and all alternatives. Decisions made in the Forest Plan are not expected to change grazing or mineral output levels, so these levels remained constant. Forest Service expenditures also remain constant for all alternatives because the analysis on output levels was conducted with the assumption that current level of budgets would continue under the Forest Plan.

Payments to state/counties remains constant for current management and all alternatives based on expected continuation of the Secure Rural Schools and Community Self-Determination Act.

Under this act, forest management does not affect federal payments to states and counties. An analysis was conducted to determine the effect if this act was not extended and payments reverted to the 25 percent Payments. If this was to occur, employment would be decreased by approximately 140 jobs and $5,000,000 in labor income in all alternatives.

Payments to Counties

IPNF management will not affect payments to counties if the Secure Rural Schools and Community Self-Determination Act is reauthorized into the future. However, if this act expires and no other act replaces it, payments would revert to 25 percent Payments (as under the National Forest Revenue Act of 1908). If this were the case, payments to counties would be greatly diminished from current levels. Alternatives providing the highest level of receipts would provide the highest amount of payments to counties. Alternatives C and B Modified would provide the highest while Alternatives A and D would provide the lowest levels of payments to counties and states. The 25 percent Payments for the five-county area are estimated to range from a high of $1,729,000 under Alternative C to a low of $1,322,000 under Alternative D. The current level of payments associated with the IPNF for the five-county area is $8,070,000 under the Secure Rural Schools and Community Self-Determination Act. A return to 25 percent Payments would result in a large reduction in payments to counties. Effects would be greatest in those counties where federal payments are a larger portion of the county budget, such as Shoshone County

Payments from payment in lieu of taxes may increase under reduced Forest Service payments to counties, depending on appropriations from Congress. The amount of increase is unknown, but would generally be insufficient to offset the reduction in Forest Service payments under the 25 percent Payments.

Economic Efficiency

The main criterion used in assessing economic efficiency is present net value, which is defined as the value of discounted benefits minus discounted costs. A present net value analysis includes all outputs, including timber, grazing, recreation, and minerals, to which monetary values are assigned. The monetary values include both market and nonmarket values. See appendix B for a description of these values and the economic analysis.

Table 179 shows estimated benefits, costs, and cumulative present net value by alternative. All monetary values are expressed in constant dollars with no allowance for inflation. A 4 percent discount rate was used over a fifty-year period (2014 – 2063). The reduction in present net value in any alternative as compared to the most economically efficient solution is the economic trade-off, or opportunity cost, of implementing that alternative.

Table 179. Economic Efficiency by Alternative (in thousands of dollars)

	Alt. A	Alt. B Modified	Alt. C	Alt. D
Present Net Value	$1,608,539	$1,606,925	$1,609,301	$1,601,403
Present Value of Benefits	$2,221,652	$2,219,038	$2,222,414	$2,214,517
Present Value of Costs	$613,114	$613,114	$613,114	$613,114

The forest service budget was held constant at current levels for all alternatives. The amount of benefits changed by alternative based on the amount and type of timber that was projected to be harvested over the next 50 years. The present net value is positive for all alternatives, indicating the alternatives are economically efficient. The alternative with the highest present net value is Alternative C and the alternative with the lowest present net value is Alternative D. However, as table 179 indicates, differences between alternatives for present net value are slight.

When evaluating trade-offs, the use of present net value and net public benefit is often misunderstood. In each alternative, present net value was maximized in an attempt to ensure that the alternative would be efficient in its use of tax dollars and land. The present net value coupled with indicators for Forest Plan goals (such as contributing to the social and economic well-being of local communities, moving vegetation toward desired conditions, and improving the capability of the Forest to provide high-quality recreation opportunities) can be used to estimate net public benefits, compare alternatives, and assist in choosing a preferred alternative.

Cumulative Effects

There are many factors that influence and affect the local social and economic environment. National, state, and county policies affect population growth, demographics, and land uses. Following is a brief description of some items that are changing or may change in the future, adding to the effects on local communities from the alternatives.

Population Growth

The West has been the fastest growing region in the country, and this trend is expected to continue for the next 20 years (U.S. Census 2000 data and projections). With this increased growth rate comes an increased diversification of the population. More new residents are migrating in, while the adult children of families living in the region are moving out of the area to find employment. This change in population composition has added to the diversity of attitudes, lifestyles, and values of the population within the planning area. The social assessment for the IPNF identified some implications of this in-migration, including: 1) a declining tax base in relation to new residents; 2) increased overall recreational use of resources; 3) shifts in the proportion of multiple uses; and 4) probably related shifts in the expectations about forest management (Parker et al. 2002:29-32).

Development of Forestlands

There has been increased housing density adjacent to and within national forest boundaries, and this trend is expected to continue over the next several decades. Moderate and high increases in residential development are projected around national forests located in Montana and Idaho (Stein et al. 2007). While local urban, county, and regional planners and the public are making progress in defining desirable development and recognizing the inherent costs and effects associated with subdivision sprawl, growth will continue in some form and overall density will increase. This development would likely add pressure on adjacent Forest Service lands. Pressure would include increased demand for potentially conflicting recreation opportunities, services such as road maintenance, demand for undeveloped and semi-primitive settings, and increased fire management problems.

Subdividing Corporate Timberlands

The Idaho Statewide Forest Resource Strategy (Kimball and Stephenson 2010) identified development pressure as an issue for forestland. This development results in a loss of productive forests and pressure to eliminate management on adjacent lands. Conversion to a higher housing density results in a loss of canopy and the benefits it provides. This development pressure can affect lifestyles and values, especially to those that value undeveloped areas. Development pressure can also lead to decreased timber harvest because of the loss of forests and the impact development has on watersheds and wildlife.

Future Wood Products Development

The wood products industry is important in managing forests and providing products to both national and global markets. The Idaho Statewide Forest Resource Strategy (Kimball and Stephenson 2010) identified the potential benefit to wood products markets from managing forestland. The Strategy notes “When markets and mills shut down, incentives to manage forests are significantly diminished, leading to an increase in forest insect and disease infestations, fire risk, and a decline in overall forest health.” The Strategy includes a goal to provide forest-based wood products markets that are economically vibrant and sustainable. One method to achieve this goal is to develop diverse markets and product lines.

The majority of timber harvested in Idaho comes from private lands, providing more than 60 percent of the volume harvested in 2010. State lands provided just under one-third and federal lands provided about 10 percent of Idaho’s total timber harvest in 2010 (Morgan et al. 2011). The amount of timber harvest on state and private lands and adjacent national forests will affect the local economy. Additional harvest from these lands would help to stabilize local jobs and income. Any decrease in harvest would add to a decrease in associated jobs and income.

Other Required Disclosures

Environmental Justice

As required by Executive Order 12898, all federal actions must consider potentially disproportionate effects on minority or low-income communities. The Forest Plan is strategic and programmatic in nature, providing guidance and direction to future site-specific projects and activities. The Plan does not create, authorize, or execute any ground-disturbing activity, although it does provide for the consideration of certain types of activities. Site-specific activities will consider potential disproportionate effects on minority or low-income communities during project planning.

The social assessment for the IPNF (Parker et al. 2002) and the assessment of social conditions and trends (Russell et al. 2006) did not identify any disproportionate impacts from forest management. In addition, collaboration on the Plan did not identify any concerns regarding disproportionate impacts to low-income or minority populations. The Forest also coordinated and consulted with federally-recognized tribes that had/have traditional uses within the Forest boundary. See the “American Indian Rights and Interests” section of chapter 3. No disproportionate impacts were identified by the Tribes.

American Indian Religious Freedom Act

Agencies must make a good faith effort to understand how Indian religious practices may come into conflict with other forest uses and consider any adverse impacts on these practices in their decision-making practices. Within the boundaries of the IPNF there are two tribes with Treaty reserved, off-reservation rights: the Kootenai Tribe of Idaho and the Confederated Salish and Kootenai Tribes. In addition, the Coeur d′Alene Tribe of Idaho has reserved rights through executive order on a limited section of the Coeur d′Alene River Ranger District. Federal guidance for tribal consultation directs the Forest to increase and improve the involvement of tribes in the decision-making process in the areas where our decisions affect tribes and their treaty rights and interests. There is a trust responsibility with regard to managing the resources on which the treaties are based. The Forest is also required to consult with all federally-recognized tribes that had/have traditional uses within the forest boundary. This consultation extends to the Kootenai Tribe of Idaho, the Kalispel Tribe of Indians, the Coeur d′Alene Tribe of Idaho, the Confederated Salish and Kootenai Tribes, the Spokane Tribe of Indians, the Confederated Tribes of the Colville Reservation, and the Nez Perce Tribe. No effects on American Indian social, economic, or subsistence rights are anticipated as a result of this Forest Plan revision effort. No matter which alternative is chosen for implementation, the Forest will be required to consult with tribes when management activities may impact treaty rights and/or cultural sites and cultural use, according to the Consultation Protocol. Desired conditions for American Indian Rights and Interests, for all action alternatives, would be for the IPNF to: recognize and maintain culturally significant species and the habitat necessary to support healthy, sustainable, and harvestable plant and animal populations to ensure that rights reserved by tribes in the Treaty are not significantly impacted or diminished; recognize, ensure, and accommodate tribal member access to the Forest for the exercise of Treaty Rights and Cultural uses consistent with law, policy, and regulation; and recognize and protect traditional cultural areas as associated with the traditional beliefs of a Tribe about its cultural history.

Unavoidable Adverse Effects

Forest Plan revision and Forest Plans do not produce unavoidable adverse effects because they do not directly implement any management activities that would result in such effects. However, the Forest Plans do establish management emphasis and direction for implementation of activities that may occur on NFS lands in the planning period. If those activities occur, the application of forestwide, management area, and geographic area standards and guidelines (as described in the revised Forest Plan) would limit the extent and duration of any resulting environmental effects. Some unavoidable effects could still occur; however, these potential effects are described by resource area throughout chapter 3 of this EIS, primarily under “Environmental Consequences.”

Relationship of Short-term Uses and Long-term Productivity

Short-term uses are those expected to occur for the planning period (10 to 15 years), including recreation use, timber harvest, and prescribed burning. Although the Forest Plan does not directly implement these uses, the potential for these uses are described in the Forest Plan goals and objectives, both at the forestwide and MA levels (see revised Forest Plan).

Long-term productivity refers to the capability of the land to provide resource outputs for a period beyond the planning period. Minimum management requirements, established by regulation (31 CFR 219.27), provide for maintenance of long-term productivity of the land. Minimum management requirements are contained in forestwide and MA standards and guidelines and would be met under any alternative. They ensure that the long-term productivity of the land is not impaired by short-term uses.

Monitoring and evaluation, as described in the revised Forest Plan, applies to all alternatives. A primary purpose of monitoring is to ensure that long-term productivity of the land is maintained or improved. If monitoring and evaluation show that Forest Plan standards and guidelines are inadequate to protect long-term productivity of the land, then the Plan will be adjusted (through amendment or revision) to provide for more protection or fewer impacts.

Although all alternatives are designed to maintain long-term productivity, there are differences among the alternatives in the long-term availability or condition of resources. There may also be differences among alternatives in long-term expenditures necessary to maintain or achieve desired conditions. The differences are discussed throughout the various sections in chapter 3 of this EIS.

Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable commitments of resources are defined in FSH 1909.15, Environmental Policy and Procedures.

Irreversible commitments of resources mean the consumption or destruction of nonrenewable resources, such as minerals or cultural resources, or the degradation of resources such as soil productivity, which can be renewed only over long periods.

Irretrievable commitments of resources are opportunities forgone; they represent tradeoffs in the use and management of forest resources. Irretrievable commitments of resources include expenditure of funds, loss of production, or restrictions on resource use. When one alternative produces less of a natural resource (such as timber volume) or offers fewer opportunities for use (such as non-motorized recreation) than another alternative, the difference represents an irretrievable commitment of resources.

The decisions made in Forest Plan revisions do not represent actual irreversible and irretrievable commitments of resources. This is because forest planning identifies what kinds and levels of activities are appropriate in different parts of the forest; it does not make project decisions. The decision to irreversibly or irretrievably commit resources occurs at: (1) the time the Forest Service makes a project decision, such as approving new trail construction or a timber sale; (2) the time Congress acts on a recommendation to establish a new wilderness or to include a stream segment in the wild and scenic river system; or (3) the time the regional forester designates a research natural area.

Energy Requirements and Conservation Potential

Energy is consumed in the administration of natural resources from the national forests. The main activities that consume energy are timber harvest, restoration activities (mechanical vegetation treatments and prescribed and use of natural, unplanned ignitions to meet resource objectives), recreation use, road construction and reconstruction, range use, and administrative activities of the Forest Service and other regulatory agencies. Energy consumption is expected to vary only slightly by alternative. Those alternatives with higher potential for restoration activity, timber harvest and/or road construction, reconstruction and obliteration (Alternatives B Modified, and D) are expected to have higher levels of energy use. Alternatives that have lower potential for these activities (C and A) are expected to have slightly lower levels of energy use.

Several opportunities exist under all alternatives to provide for energy conservation or conversion from less plentiful fuels to more plentiful fuels. For example, car-pooling and combining trips saves fuels and wear and tear on the Forest fleet. The use of electronic communication devices for sharing information rather than scheduling meetings at one location saves energy spent on travel. Improving energy efficiency of government buildings can conserve energy. More energy-efficient equipment for all activities like timber harvesting, road construction and reconstruction, or road maintenance can be required. More energy-efficient management methods can be explored and implemented as well.

Prime Farmland, Rangeland, and Forestland

No prime farmland, rangeland, or forestland has been identified in the planning area. Forest Plan revision or the Forest Plan would not directly affect such lands; although implementation of the Plan could have indirect effects. Regardless of the alternative selected for implementation, NFS lands would be managed with sensitivity to the values of any adjacent private or public lands.

Threatened and Endangered Species

Potential effects to species listed under the ESA can be found in chapter 3 of this EIS, as well as in the Wildlife Resource specialist report, the Aquatics/Soils/Riparian/Wetlands specialist report, and the Rare Plants specialist report (project file). The Biological Assessment and Biological Evaluation will be finalized for the revised Forest Plan and final EIS. Management direction to protect the threatened, endangered, candidate, and sensitive species, or to provide for their habitats, can be found in the revised Forest Plan (forestwide, management area, and geographical area desired conditions, standards, and guidelines).

Wetlands and Floodplains

The Forest Plan revision and Forest Plans do not directly implement any management activities that would result in loss of wetland or floodplains. Revised forestwide management direction identifies the need to restore currently degraded wetlands and floodplains, and provides a broad spectrum of standards and guidelines designed to protect soil, water, riparian, and aquatic resources. The goals and intent of Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) would be met through compliance with this direction. Documentation for this conclusion can be found in this EIS, chapter 3, “Watersheds, Soils, Riparian and Aquatic Habitat/Species,” and in the revised Forest Plan (desired condition, standards, and guidelines).

Conflicts with Other Agency or Government Goals or Objectives

Contact, review, and public involvement with other federal and state agencies indicate no major conflicts between the revised Forest Plan and the goals and objectives of other governmental entities.

Chapter 4. List of Preparers

The preparation of the final environmental impact statement (FEIS) and the revised Forest Plan has been a major undertaking. This list of preparers is limited to those people who were members of the Interdisciplinary Team (IDT) working on these final documents. Preparation of these documents could not have been completed without the support and assistance of numerous employees on the IPNF, past employees on the IPNF who have retired or moved to other positions, and our colleagues in the regional office. We also recognize the forest leadership team as providing guidance during this process.

Members of the Interdisciplinary Team:

Name	Unit	Position
Anderson, Jeremy	KNF	Wildlife Biologist
Cobb, Dave	IPNF	Vegetation and Fire Specialist
Dekome, Shanda	IPNF	Planning Staff
Frament, Ellen	KNF	Team Leader, Analyst and Economist
Scaife, Dan	IPNF	Hydrologist and Fisheries Biologist
Sutton, Darcie	KNF	Writer Editor
Wellner, Kent	IPNF	Recreation Specialist (now on the Willamette NF)

Support to the Interdisciplinary Team:

Name	Unit	Position
Allen, Lydia	IPNF	Wildlife Biologist
Colyer, Sue	IPNF	Recreation
Gibson, Shawn	IPNF	Archaeologist
Harris, Greg	IPNF	GIS Support
Kmonk, Nancy	KNF	GIS Support
Neils, Chandra	IPNF	Soils Scientist
Peel, Timory	Contract	Transportation
Ratcliffe, Carol	IPNF	Transportation
Williams, Emily	IPNF	Forest Planner (Coconino NF, detailed to IPNF)
Young, Will	IPNF	Hydrologist and Fisheries Biologist (detailed to IDT)
Zack, Art	IPNF	Ecologist

Chapter 5. Agencies & Individuals Receiving EIS

Distribution of the Environmental Impact Statement

This EIS has been distributed to individuals who specifically requested a copy of the document. In addition, copies have been sent to the following federal agencies, federally recognized tribes, state and local governments, and organizations.

Agency	Format		
	Hard Copy	CD	Web
Director, Planning and Review Advisory Council on Historic Preservation			X
Deputy Director USDA APHIS PPD/EAD			X
Rural Utilities Service (RUS)			X
Natural Resources Conservation Service National Environmental Coordinator			X
USDA, National Agricultural Library Head, Acquisitions & Serials Branch	X	X	X
NOAA Fisheries Service NW Region Habitat Conservationists Division			X
United States Army Corps of Engineers Northwestern Division			X
Chief of Naval Operations Energy and Environmental Division			X
Environmental Protection Agency Region 10 EIS Review Coordinator	X		
Director, Office of Environmental Policy and Compliance United States Department of the Interior	X		X
Northwest Power Planning Council			X
United States Coast Guard (USCG) Commandant CG-47 Department of Homeland Security			X
Northwest Mountain Region Regional Administrator Federal Aviation Administration			X
Division Administrator Federal Highway Administration			X
United States Department of Energy Director, Office of NEPA Policy and Compliance			X

Chapter 6. Glossary

Term	Definition
303(d) segments	A stream or other waterbody that is listed by the state as being "water quality impaired" by a pollutant in their current 303(d) list or 303(d)/305(b) Integrated Report, pursuant to the Clean Water Act.
Activity Area	A land area affected by a management activity to which soil quality standards are applied. Activity areas include harvest units within timber sale areas, prescribed burn areas, recreation areas, and grazing areas or pastures within range allotments.
Allotment Management Plan (AMP)	A document applying to management of rangeland ecosystems and livestock operations on the public lands prescribing: (1) the manner in and extent to which livestock operations will be conducted in order to meet ecosystem health, multiple use, economic, and other objectives; (2) describing range improvements to be installed and maintained; and (3) containing such other provisions relating to livestock grazing and other objectives found by the Secretary of Agriculture to be consistent with the provisions of Federal Land Policy and Management Act. An AMP integrates resource objectives, standards, guidelines, and management requirements for soil and water for watershed protection, wildlife and fisheries, recreation, timber, and other resources on lands within a range allotment.
Allowable Sale Quantity (ASQ)	The quantity of timber that may be sold from the area of suitable land covered by the Forest Plan for a time period specified by the Plan. This quantity is usually expressed on an annual basis as the "average annual allowable sale quantity."
Alternative	A combination of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. One of several policies, plans, or projects proposed for decision making. An alternative need not substitute for another in all respects.

Term	Definition
Ancient Cedar Groves	Stands containing some cedar trees 60 inches or greater DBH and/or 500 years old. The density of 60 inches or greater DBH trees may be low and the distribution is often patchy, but these big (and/or old trees) can be found at least occasionally, scattered across the grove. Usually covers at least one-half acre in area, unless there is a concentration of 60 inches or greater DBH trees on a smaller area. In the same stand, there are often (but not always) additional unusually large 48 inches or greater DBH trees.
Animal Unit Month (AUM)	The amount of forage required by a one thousand pound cow, or the equivalent, for one month.
Aquatic Ecosystem	Waters of the United States that serve as habitat for interrelated and interacting communities and populations of plants and animals. The stream channel, lake or estuary bed, water, biotic communities and the habitat features that occur therein.
Bear Year	The active bear year is from April 1 to November 15 Spring = April 1 to June 15; Summer = June 16 to September 15; Fall = September 16 to November 15 (Selkirk Recovery Zone) or November 30 (Cabinet-Yaak Recovery Zone); Winter = November 16 (Selkirk) or December 1 (Cabinet-Yaak) to March 30
Bears Outside of Recovery Zone	An area where one would reasonably expect to find grizzly bear use occurring during most years.
Bear Management Unit (BMU)	Areas established for use in grizzly bear analysis. Bear management units generally: a) Approximate female home range size; and b) Include representations of all available habitat components.
Beneficial Uses	Any of the various uses which may be made of the water, including, but not limited to, domestic water supplies, fisheries and other aquatic life, industrial water supplies, agricultural water supplies, navigation, recreation in and on the water, wildlife habitat, and aesthetics.
Best Management Practices (BMPs)	Practice or set of practices that enable a planned activity to occur while still protecting the resource managed, normally implemented and applied during the activity rather than after the activity.

Term	Definition
Big Game	Those species of large mammals normally managed as a sport hunting resource. Generally includes elk, moose, white-tailed deer, mule deer, mountain goat, bighorn sheep, black bear, and mountain lion.
Biodiversity	The variety and abundance of species, their genetic composition, their communities and the ecosystems and landscapes of which they are a part. As used in this document, biodiversity refers to native biological diversity; therefore, increase in species diversity resulting from the introduction of non-native species would not constitute an increase in biodiversity.
Biophysical Setting	An aggregation of vegetation response units, grouped by broad, climatic modifiers including temperature and moisture gradients.
Candidate Species	Plant and animal species being considered for listing as endangered or threatened under the Endangered Species Act.
Carbon Sequestration	The process by which atmospheric carbon dioxide is taken up by trees, grasses, and other plants through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils. The sink of carbon sequestration in forests and wood products helps to offset sources of carbon dioxide to the atmosphere, such as deforestation, forest fires, and fossil fuel emissions.
Cavity	The hollow excavated in a tree that is used by birds or mammals for roosting and/or reproduction.
Coarse Woody Debris	Coarse Woody Debris consists of dead woody material larger than 3 inches in diameter and derived from tree limbs, boles, and roots.
Community (Ecological)	A group of organisms living together; any group of interacting organisms.

Term	Definition
Community Wildfire Protection Plan	A plan for an at-risk community that: Is developed within the context of the collaborative agreements and the guidance established by the Wildland Fire Leadership Council and agreed to by the applicable local government, local fire department, and state agency responsible for forest management, in consultation with interested parties and the federal land management agencies managing land in the vicinity of the at-risk community; Identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on federal and non-federal land that will protect one or more at-risk communities and essential infrastructure; and Recommends measures to reduce structural ignitability throughout the at-risk community.
Composition (stand)	The proportion of each tree species in a stand expressed as a percentage of the total number, basal area, or volume of all tree species in the stand.
Connectivity	The arrangements of habitats that allows organisms and ecological processes to move across the landscape; patches of similar habitats are either close together or linked. The opposite of fragmentation.
Conservation Subwatersheds	Subwatersheds (6th level HUC) are considered to have excellent habitat, excellent water quality, and strong populations of native fish species. These areas are intended to protect stronghold populations of native salmonids and complement restoration efforts. See also Priority Watersheds.
Corridors	Avenues along which wide ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can be replenished from other areas.
Critical Habitat	Specific areas within the geographic area occupied by the species on which are found those physical and biological features (1) essential to the conservation of the species, and (2) which may require special management considerations or protection.
Cultural Resources	The physical remains of human activity (artifacts, ruins, burial mounds, petro glyphs, etc.) and conceptual content or context (as a setting for legendary, historic, or prehistoric events, as a sacred area of native people, etc.) of an area of prehistoric or historic occupation.

Term	Definition
Decommission	Demolition, dismantling, removal, obliteration and/or disposal of a deteriorated or otherwise unneeded asset or component, including necessary cleanup work. This action eliminates the deferred maintenance needs for the fixed asset.
Deferred Maintenance	Maintenance that was not performed when it should have been or when it was scheduled, and therefore, was put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value. Code compliance (e.g., life safety, ADA, OSHA, environmental, etc.), Forest Plan Direction, Best Management Practices, Biological Evaluations other regulatory or Executive Order compliance requirements, or applicable standards not met on schedule are considered deferred maintenance.
Designated Route	A NFS road, a NFS trail, or an area on NFS lands that is designated for motor vehicle use pursuant to 36 CFR 212.51 on motor vehicle use maps.
Disturbance	A discrete event that changes existing plant community composition or structure; and interrupts, changes, or resets the ongoing succession sequence. Or: Human presence, noise, or other activity that causes wildlife to move away from the area or alter behavior.
Dominance Group	Dominance group is determined by the following: **Single species –** species that makes up at least 60 percent of the canopy cover or weighted basal area. **Species mix –** No single species determination can be made. Type of mix, either tolerant or intolerant, is determined by what species combination makes up 80 percent of the canopy cover or weighted basal area, with each species contributing more than 20 percent of the total. Mixed species were combined with vegetation response units to derive a single species label, based on predominant vegetation types within a vegetative response unit.
Down Wood	Accumulation of woody material scattered on the forest floor that consists of two categories: coarse woody debris and fine woody debris.
Ecological Conditions	Components of the biological and physical environment that can affect diversity of plant and animal communities and the productive capacity of ecological systems. These components could include the abundance and distribution of aquatic and terrestrial habitats, roads and other structural developments, human uses, and invasive, exotic species.

Term	Definition
Ecosystem	A spatially explicit unit of the earth that includes all the organisms, along with all components of the abiotic environment within its boundaries.
Ecosystem Diversity	The variety and relative extent of ecosystem types, including their composition, structure, and processes within all or a part of an area of analysis.
Ecosystem Function	Includes energy flows of materials across and within the landscape and how one ecosystem influences another. Function also relates to energy processes such as fire, hydrological processes (including floods), and matter and energy exchange throughout the food chain.
Ecological Integrity	The capacity to support and maintain a balanced, integrated, and adaptive biological system having the full range of elements and processes expected in a region's natural habitat.
Elk Management Units	A subset of big game hunting subunits that occur in the Coeur d'Alene and St. Joe GAs, etc.
Endangered Species	A plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.
Environmental Impact Statement (EIS)	A detailed written statement as required by Sec. 102(2) C of NEPA
Fire-Adapted Ecosystem	An arrangement of populations that have made long-term genetic changes in response to the presence of fire in the environment.
Fire Regime	The fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity (stand maintenance) fires to long-interval, high-intensity (stand replacement) fires.
Fire Suppression	The practice of controlling forest and rangeland fires in a safe, economical, and expedient fashion while meeting the natural resource objectives outlined in each forest's or grassland's land management plan.
Forest Inventory Analysis (FIA)	A data source for forestwide vegetation. FIA inventories provide a statistical-based sample of forest resources that can be used for planning and analyses at local, state. regional and national levels.

Term	Definition
Fire Management Plan	A plan that identifies and integrates all wildland fire management and related activities within the context of approved land/resource management plans. It defines a program to manage wildland fires (wildfire and prescribed fire). The plan is supplemented by operational plans, including but not limited to preparedness plans, preplanned dispatch plans, prescribed fire burn plans and prevention plans. Fire management plans assure that wildland fire management goals and components are coordinated.
Forest Health	The perceived condition of a forest derived from concerns about such factors as its age, structure, composition, function, and vigor, presence of unusual levels of insects and disease, and resilience to disturbance.
Forest Road or Trail	A road or trail wholly or partially within or adjacent to and serving the NFS that the Forest Service determines is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources.
Fragmentation	A condition in which a continuous area is reduced and divided into smaller sections. Habitat can be fragmented by natural events or development activities.
Fuel Treatment	Any manipulation or removal of fuels to lessen potential damage and resistance to control (includes mechanical and prescribed fire treatments).
Goods and Services	The various outputs, including on-site uses, produced by forest and rangeland resources.
Grazing	The authorized use of standing vegetation on NFS lands for livestock production within permitted grazing allotments.
Grazing Allotment	Area designated for the use of a certain number and kind of livestock for a prescribed period of time.
Grizzly Bear Core Habitat	An area of secure habitat within a bear management unit that contains no motorized travel routes or high use non-motorized trails during the non-denning season and is more than 0.3 miles (500 meters) from a drivable road. Core areas do not include any gated roads but may contain roads that are impassible due to vegetation or constructed barriers. Core areas strive to contain the full range of seasonal habitats that are available in the bear management unit.

Term	Definition
Grizzly Bear Recovery Zone	The area in each grizzly bear ecosystem within which the population and habitat criteria for achievement of recovery will be measured. Cabinet/Yaak grizzly bear recovery zone: This zone is approximately 2,600 square miles. The recovery zone is located in northwestern Montana and northern Idaho and includes portions of the Kootenai, Lolo, and Idaho Panhandle National Forests. Selkirk grizzly bear recovery zone: This zone is approximately 2,200 square-miles and includes portions of the IPNF and Colville National Forests, as well as 1,034 square miles of habitat in British Columbia, Canada.
Habitat Guilds	A set of species that share a common habitat (such as riparian areas), that use the same resources (such as food), or that use resources in the same manner (such as mode of foraging).
Habitat Type	All land areas potentially capable of producing similar plant communities (associations) at climax.
Head Month	One month’s use and occupancy of the range by one animal. For grazing fee purposes, it is a month’s use and occupancy of range by one weaned or adult cow with or without calf, bull, steer, heifer, horse, burro, or mule, or five sheep or goats.
Hibernacula	Habitat niches where certain animals (e.g., bats) over-winter, such as caves, mines, tree hollows, or loose bark.
Hiding Cover	Vegetation capable of hiding 90 percent of a bull elk or adult deer from the view of a human at a distance equal to or less than 200 feet during all seasons of the year that elk or deer use the area. Generally any vegetation used for security or to escape from danger.
Historic Range of Variability (HRV)	The variation in spatial, structural, compositional, and temporal characteristics of ecosystem elements as affected by minor climatic fluctuations and disturbances within the current climatic period. This range is measured during a reference period prior to intensive resource use and management. The range of historic variability is used as a baseline for comparison with current conditions to assess the degree of past change.

Term	Definition
Hydrologic Unit (HU)	A hydrologic unit is a drainage area delineated to nest in a multi-level, hierarchical drainage system. Its boundaries are defined by hydrographic and topographic criteria that delineate an area of land upstream from a specific point on a river, stream, or similar surface waters. A hydrologic unit can accept surface water directly from upstream drainage areas, and indirectly from associated surface areas such as remnant, non-contributing, and diversions to form a drainage area with single or multiple outlet points. Hydrologic units are only synonymous with classic watersheds when their boundaries include all the source area contributing surface water to a single defined outlet point.
Hydrologic Unit Code (HUC)	The numeric identifier of a specific hydrologic unit consisting of a 2-digit sequence for each specific level within the delineation hierarchy. 4th code refers to the 4th pair of an 8-digit code of a sub basin HUs that is generally 450,000 acres in size. 5th code refers to the 5th pair of a 10-digit code of a watershed HUs that generally ranges from 40,000 to 250,000 acres in size. 6th code refers to the 6th pair of a 10-digit code of a subwatershed HUs that generally ranges from 10,000 to 40,000 acres in size.
Incidental Take	Take of listed fish or wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a federal agency or applicant.
Integrity	The capacity to support and maintain a balanced, integrated, and adaptive biological system having the full range of elements and processes expected in a region’s natural habitat.
Intermediate Treatment	Any treatment or tending designed to enhance growth, quality, vigor, and composition of the stand after establishment or regeneration and prior to final harvest.
Intermittent Stored Service	An existing road where future use is expected but not known and is currently closed to vehicle traffic. The road is in a condition that there is little resource risk if maintenance is not performed.
Invasive Species	Invasive species are an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Alien species are any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem (with respect to a particular ecosystem).

Term	Definition
Invasive Weeds	See Noxious Weeds
Inventoried Roadless Areas	For National Forest System lands in Idaho, inventoried roadless areas are those areas designated as Idaho Roadless Areas pursuant to 36 CFR §294.21 and 36 CFR §294.29. These areas are identified in a set of maps maintained at the national headquarters office of the Forest Service. For National Forest System lands in Montana and Washington, inventoried roadless areas are those areas mapped under the 2001 Roadless Area Conservation Rule. These areas are identified in appendix C of the FEIS for the revised Forest Plan. The official set of maps is maintained at the national headquarters office of the Forest Service.
Keystone Species	A species whose impact on its community or ecosystem is large, and disproportionately large relative to its abundance.
Landbird Assemblage	A group of species having similar ecological resource requirements and foraging strategies, and therefore, having similar roles in the community.
Landscape	An area composed of interacting, and interconnected patterns of habitats (ecosystems) that are repeated because of the geology, land form, soil, climate, biota and human influences throughout the areas. Landscape structure is formed by patches, connections, and the matrix. Landscape function is based on disturbance events, successional development of landscape structure, and flows of energy and nutrients through the structure of the landscape. A landscape is composed of watersheds and smaller ecosystems. It is the building block of biotic provinces and regions.
Landscape Pattern	Number, frequency, size and juxtaposition of landscape elements (stands and patches) that are important to the determination or interpretation of ecological processes.
Large Woody Debris	Large pieces of relatively stable, woody material located within the bankfull channel and appearing to influence bankfull flows. They are categorized as singles, aggregates, or rootwads. **Single** – A single piece that has a length equal to or greater than three meters or two-thirds of the wetted stream width and 10 cm in diameter one-third of the way from the base. **Aggregate –** Two or more clumped pieces, each of which qualifies as a single piece. **Rootwad** – Rootmass or boles attached to a log less than three meters in length.

Term	Definition
Long-term Sustained Yield Capacity	The highest uniform wood yield from lands being managed for timber production that may be sustained under specified management intensity consistent with multiple-use objectives.
Lynx Analysis Units	A lynx analysis unit is an area of at least the size used by an individual lynx, from about 25 to 50 square miles. A project analysis unit upon which direct, indirect, and cumulative effects analyses are performed.
Mechanized	Wheeled forms of transportation including non-motorized carts, wheelbarrows, bicycles, and any other non-motorized, wheeled vehicle.
Minerals (Locatable)	Those hard-rock minerals that are mined and processed for the recovery of metals. They also may include certain nonmetallic minerals and uncommon varieties of mineral materials, such as valuable and distinctive deposits of limestone or silica.
Minerals (Leasable)	Coal, oil, gas, phosphate, sodium, potassium, oil shale, sulfur, and geothermal resources.
Minerals- Materials (Salable)	A collective term to describe common varieties of sand, gravel, stone, pumice, pumicite, cinders, clay, and other similar materials. Common varieties do not include deposits of those materials that may be locatable.

Term	Definition
Minimum Impact Suppression Tactics (MIST)	The concept of Minimum Impact Suppression Tactics is to use the minimum amount of forces necessary to effectively achieve fire management protection objectives. It implies a greater sensitivity to the impacts of suppression tactics and their long-term effects, when determining how to implement an appropriate suppression response. Fire managers and firefighters select tactics that have minimal impact to values at risk. These values are identified in approved Land or Resource Management Plans. Standards and guidelines are then tied to implementation practices which result from approved Fire Management Plans. Minimum Impact Suppression Tactics is not intended to represent a separate or distinct classification of firefighting tactics but rather a mindset of how to suppress a wildfire while minimizing the long-term effects of the suppression action on other resources. The principle of fighting fire aggressively but providing for safety first will not be compromised in the process and when selecting an appropriate suppression response, firefighter safety must remain the highest concern. **Examples of Minimum Impact Suppression Tactics might include;** “Personnel should avoid using rehabilitated fire lines as travel corridors whenever possible because of potential soil compaction and possible detrimental impacts to rehab work,” or ”avoid use of non-native materials for sediment traps in streams.”
Mitigation	Measures implemented to minimize, reduce, rectify, avoid, eliminate, and/or compensate the potential impacts to resources identified in the effects analysis.
Mixed Severity Fire	A fire severity classification where between 25 and 75 percent average top-kill of vegetation occurs within a typical fire perimeter.
National Forest System Road	A Forest road other than a road that has been authorized by a legally documented right-of-way held by a state, county or other local public road authority.

Term	Definition
National Register of Historic Places	The National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of Interior.
Native Species	Animals or plants that have historically occupied a given aquatic or terrestrial area.
Natural, Unplanned Fire	A wildland fire ignited by a natural event such as lightning.
Noxious Weeds (invasive weeds)	Plants designated as noxious weeds by the Secretary of Agriculture or by the responsible state official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof.
Off-highway Vehicle	Any motor vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain.
Old Growth	Old growth stands are defined as those that meet the definitions in Green et al. 1992 (errata corrected 12/11). Those definitions include the discussion in that document titled "USE OF OLD GROWTH TYPE DESCRIPTIONS" (see pages 11 and 12). If that document is revised or replaced by the Northern Region, the updated version will be used.
Open Motorized Route Density	Calculation made with the moving windows technique that includes open roads, other roads not meeting all restricted or obliterated criteria, and open motorized trails. The percent of the analysis area in relevant route density classes are calculated.
Openings	Meadows, clear-cuts, and other areas of vegetation that do not provide cover.
Outstandingly Remarkable Value	A river-related value that is a rare, unique, or exemplary feature that is significant at a comparative regional or national scale.

Term	Definition
Over-Snow Vehicle	A motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis, while in use over snow.
Pacific Decadal Oscillation	A pattern of Pacific climate variability that shifts phases on at least inter-decadal time scale, usually about 20 to 30 years. The pacific decadal oscillation is detected as warm or cool surface waters in the Pacific Ocean, north of 20 degrees N. During a “warm”, or “positive”, phase, the west Pacific becomes cool and part of the eastern ocean warms; during a “cool” or negative” phase, the opposite pattern occurs.
Plan Area	The National Forest System lands covered by a plan.
Planned Ignition (Prescribed Fire)	The intentional initiation of a wildland fire by hand-held, mechanical or aerial device where the distance and timing between ignition lines or points and the sequence of igniting them is determined by environmental conditions (weather, fuel, topography), fire technique, and other factors which influence fire behavior and fire effects (see prescribed fire).
Prescribed Fire	A wildland fire originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed fire plan for which NEPA requirements (where applicable) have been met prior to ignition (see planned ignition).
Present Net Value	The difference between the discounted values (benefits) of all outputs to which monetary values or established market prices are assigned and the total discounted costs of managing the planning area.
Priority Watersheds	Subwatersheds (6th level hydrologic units) as described in INFISH (USDA Forest Service 1995), which are intended to provide a pattern of protection across the landscape, where habitat for inland native fish would receive special attention and treatment and would have the highest priority for restoration, monitoring, and watershed analysis. Priority watersheds have been further refined by Conservation Subwatersheds and Restoration Subwatersheds for implementation of this Forest Plan.
Proposed Species	Any species that is proposed by the U.S. Fish and Wildlife Service or National Marine Fisheries Service to be listed as threatened or endangered under the Endangered Species Act.

Term	Definition
Recreation Opportunity Spectrum (ROS)	A framework of land delineations that identifies a variety of recreation experience opportunities categorized into classes on a continuum. The Spectrum's continuum has been divided into six major classes for Forest Service use: Urban (U), Rural (R), Roaded Natural (RN), Semi-primitive Motorized (SPM), Semi-Primitive Non-motorized (SPNM), and Primitive (P).
Recreation Sites	Specific places in the Forest other than roads and trails that are used for recreational activities. These sites include a wide range of recreational activities and associated development. These sites include highly developed facilities like ski areas, resorts, and campgrounds. It also includes dispersed recreation sites that have few or no improvements but show the effects of repeated recreation use.
Recruitment Potential Old Growth	Forest stands that do not meet the definition of old growth in Green et al. 1992 (errata corrected 12/11) but are being managed with the goal of meeting that definition in the future.
Regeneration Treatment	A cutting procedure by which a new age class is created; the major methods are clearcutting, seed tree, shelterwood, selection, and coppice.
Resilience	The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.
Resistance	The ability of an organism, population, community, or ecosystem to withstand perturbations without significant loss of structure or function. From a management perspective, resistance includes both 1) the concept of taking advantage of and boosting the inherent (biological) degree to which species are able to resist change, and 2) manipulation of the physical environment to counteract and resist physical and biological change.
Restoration	Restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. It is an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity, and sustainability.
Restoration Subwatersheds	Subwatersheds (6th level hydrologic units) are identified as having relatively degraded habitat conditions, water quality limitations, depressed populations of native fish species, or a combination of the above, and a relatively higher potential for improvement through active or passive restoration efforts. See also Priority Watersheds.

Term	Definition
Riparian Habitat Conservation Area (RHCAs)	Portions of watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific guidelines. The followings riparian habitat conservation area widths are based on the best available science and apply to all aquatic habitats, except where site-specific analysis supports modification: **Category 1 – Fish-bearing streams:** Riparian habitat conservation areas consist of the stream and the area on either side of the stream extending from the edges of the active channel to the top of the inner gorge, or to the outer edges of the one hundred-year floodplain, or to the outer edges of the riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet, including both sides of the stream channel), whichever is greatest. **Category 2 – Permanently flowing non-fish bearing streams:** Riparian habitat conservation areas consist of the stream and the area on either side of the stream extending from the edges of the active channel to the top of the inner gorge, or to the outer edges of the one hundred-year floodplain, or to the outer edges of the riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet, including both sides of the stream channel), whichever is greatest. **Category 3 – Ponds, lakes, reservoirs, and wetlands greater than one acre:** Riparian habitat conservation areas consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, to the extent of moderately and highly unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond or lake, whichever is greatest. **Category 4 – Seasonally flowing or intermittent streams, wetlands less than one acre:** This category includes features with high variability in size and site-specific characteristics. At a minimum, the riparian habitat conservation areas must include the area from the edges of the stream channel or wetland, to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.
Road	A motor vehicle route over 50 inches wide, unless identified and managed as a trail.

Term	Definition
Road Construction	FSM 7705 defines road construction or reconstruction together as the supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road (36 CFR 212.1).
Road Decommissioning	Activities that result in the stabilization and restoration of unneeded roads to a more natural state.
Road Maintenance	The objective of road maintenance is to provide for safe and efficient travel; access for administration, utilization and protection of NFS lands; and protection of the environment, adjacent resources, and public investment (FSM 7730.2). The term road maintenance is defined at FSM 7705 as the “ongoing upkeep of a road necessary to maintain or restore the road in accordance with its road management objectives (FSM 7714).” FSH 7709.59 62.1 describes the scope of road maintenance to “include any expenditure in the repair or upkeep of a road necessary to perpetuate the road and provide for its safe use. Work items may include surface rock replacement, seal coats and asphalt overlays, bridge replacement, slide removal, and other items that contribute to the preservation of the existing road. Road maintenance is not intended to substantially improve conditions above those originally constructed; however, there may be a need for adding to or modifying the original conditions without increasing the service provided. Typical examples of this include installing additional minor culverts and traffic control devices, implementing traffic management strategies, placing small quantities of spot surfacing, and revegetating cut and fill slopes.”
Road Reconstruction	FSM 7705 defines road construction or reconstruction together as the supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road (36 CFR 212.1). In practical terms, road reconstruction is conducted when the required work items to maintain or restore a road to its RMOs exceed what is expected during routine road maintenance. Additionally, work performed to upgrade the road’s service level above that for which it was originally constructed, to accommodate commercial haul or meet the needs of additional traffic, to realign an existing road for water quality protection, or to repair a road after natural disaster would be considered reconstruction.
Roadless Area	See Inventoried Roadless Area

Term	Definition
Salvage Cutting (or Salvage Logging)	The removal of dead trees or trees being damaged or dying due to injurious agents other than competition, to recover value that would otherwise be lost.
Scenic Integrity Objective (SIO)	The Scenic Integrity Objectives serve as the desired conditions for the scenic resources and represent the degree of intactness of positive landscape attributes. SIOs are categorized into 5 levels. The highest scenic integrity ratings are given to those landscapes where valued landscape attributes will appear complete with little or no visible deviations evident. Lower SIOs are given to those landscapes where modifications to the landscape will be more evident. Each of the SIOs is defined as follows: **Very High –** Landscape is intact with changes resulting primarily through natural processes and disturbance regimes. **High –** Management activities are unnoticed and the landscape character appears unaltered. **Moderate –** Management activities are noticeable but are subordinate to the landscape character. The landscape appears slightly altered. **Low –** Management activities are evident and sometimes dominate the landscape but are designed to blend with surroundings by repeating line, form, color, and texture of valued landscape character attributes. The landscape appears altered. **Very Low** (not used in the revised Plan or this EIS) – Human activities of vegetative and landform alterations may dominate the original, natural landscape character but should appear as natural occurrences when viewed at back-ground distances.
Security Habitat	An area with low levels of human disturbance. This general definition covers most uses of the term security habitat, except for elk, which has a specific definition.
Security Habitat (elk)	Generally timbered stands on NFS lands at least 250 acres in size greater than 0.5 mile away from open motorized routes during the hunting season. Security is calculated for individual Elk Management Units (EMUs). Roads not open to the public for motorized uses during the hunting season are not included in this calculation. The effects of non-motorized use and/or administrative motorized use of closed or temporary roads during the hunting season are not included in this calculation and would instead be analyzed separately at the project level.
Seral Stage	Any stage of development of an ecosystem from a disturbed, un-vegetated state to a climax plant community.

Term	Definition
Silvicultural Prescription	A silvicultural prescription is a written document that describes in detail the management activities needed to implement a silvicultural treatment or treatment sequence. The prescription is based on an examination of the stand being proposed for management. The prescription documents the results of an analysis of present and anticipated future stand conditions and evaluates this in terms of management direction. It also describes the desired future vegetation conditions in measurable terms.
Silvicultural Systems	A planned series of treatments for tending, harvesting, and re-establishing a stand.
Size Class	Size class is based on basal area weighted diameter of the plot/stand. Weighted diameter is calculated then classification is made as follows according to weighted diameter: Seedling/sapling: 0.0 – 4.9” DBH (if basal area weighted diameter is 0.0, must have 100 or more trees per acre) Small: 5.0 – 9.9” Medium: 10.0 – 14.9” Large: 15.0 +
Snag	A standing dead tree usually greater than five feet in height and six inches in diameter at breast height (DBH).
Soil Erosion	The detachment and movement of soil or rock by water, wind, ice, or gravity.
Soil Productivity	The inherent capacity of a soil to support the growth of specified plants, plant communities, and soil biota. It is often expressed by some measure of biomass accumulation.
Soil Quality	The capacity of a specific kind of soil to function, within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation and ecosystem health. In short, the capacity of the soil to function. There are two aspects of the definition: inherent soil quality and dynamic soil quality: **Inherent soil quality:** That aspect of soil quality relating to a soils natural composition and properties as influenced by the factors and processes of soil formation, in the absence of human impacts. **Dynamic soil quality:** That aspect of soil quality relating to soil properties which change as a result of soil use and management or over the human time scale.
Special Use Authorization	A permit, term permit, lease, or easement that allows occupancy, use, rights, or privileges of NFS land.

Term	Definition
Stand	A contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality to be a distinguishable unit.
Stand Replacement Fire	A fire severity classification where at least 75 percent average top-kill of vegetation occurs within a typical fire perimeter.
Stressors	Any physical, chemical, or biological entity that can induce an adverse response. Stressors can arise from physical and biological alternations of natural disturbances, increased unmanaged demand for ecosystem services (such as recreation), alterations of the surrounding landscape, chemical alterations in regional air quality, or from legacy of past management actions.
Stronghold Population	Directly associated with strong populations. For native fish, strong populations have numbers that are stable or increasing, and all major life history forms that historically occurred within the watershed are present.
Structure (stand)	The horizontal and vertical distribution of components of a forest stand including: the height, diameter, crown layers, and stems of trees, shrubs, herbaceous understory, snags, and down woody debris.
Succession	The sequential process of long-term plant community change and development that occurs following a disturbance.
Suitable Habitat	Habitat that currently has both the fixed and variable stand attributes for a given species habitat requirements. Variable attributes change over time and may include seral stage, cover type, and overstory canopy cover.
Suitability	The appropriateness of a particular area of land for applying certain resource management practices to a particular area of land, as determined by an analysis of the existing resource condition and the social, economic, and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.
Suppression	The work of extinguishing a fire or confining fire spread.
Sustainability	Meeting needs of the present generation without compromising the ability of future generations to meet their needs. Sustainability is composed of desirable social, economic, and ecological, economic conditions or trends interacting at varying spatial and temporal scales embodying the principles of multiple-use and sustained yield.

Term	Definition
Take	Regarding species listed under the Endangered Species Act: To harass, harm, pursue, hunt, shoot, kill, trap, capture, or collect or attempt to engage in any such conduct.
Temporary Road or Trail	A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or a forest trail and that is not included in a forest transportation atlas.
Threatened Species	Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range and which the appropriate Secretary has designated as a threatened species.
Timber Harvest	The removal of trees for wood fiber utilization and other multiple-use purposes.
Timber Production	The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. In addition, managing land to provide commercial timber products on a regulated basis with planned, scheduled entries.
Total Motorized Route Density	Calculations made with the moving windows technique that includes open roads, restricted roads, roads not meeting all reclaimed criteria, and open motorized trails. The percent of the analysis area in relevant route density classes is calculated.
Traditional Cultural Areas	Those areas of the forest used by American Indians for traditional activities and often referred to as “religious use areas” or “sacred areas.” They may include areas traditionally used for gathering of special forest products.
Trail	A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail.
Transitory Range	Rangelands not normally suitable for livestock grazing which have been made suitable for a period of time by a management action. In the Forest Service, this mostly pertains to areas that have been logged and provide forage for one or two decades until the trees return at high densities.
Travel Corridors	An area of vegetation that provides completely or partially suitable habitat for animals to travel from one location to another.
Ungulate	A hoofed mammal such as a deer or elk.

Term	Definition
Use of Wildland Fire	Management of either wildfire or prescribed fire to meet resource objectives specified in Land/Resource Management Plans.
Utility Corridor	A parcel of land, without fixed limits or boundaries that is being used as the location for one or more transportation or utility rights-of-way.
Vegetation Management	Activities designed primarily to promote the health of forest vegetation in order to achieve desired results. When vegetation is actively managed, it means that it is manipulated or changed on purpose by humans to produce desired results. Where active management of vegetation is required, techniques are based on the latest scientific research and mimic natural processes as closely as possible. Vegetation management is the practice of manipulating the species mix, age, fuel load, and/or distribution of wildland plant communities within a prescribed or designated management area in order to achieve desired results. It includes prescribed burning, the use of unplanned fire ignitions, grazing, chemical applications, biomass harvesting, and any other economically feasible methods of enhancing, retarding, modifying, transplanting, or removing the aboveground parts of plants.
Vegetation Response Unit	Units of land with vegetative communities that have broadly similar disturbance responses and succession pathways, and that produce similar landscape-scale vegetation patterns. Vegetative response units are typically groups of habitat types aggregated by landform and topographic characteristics that regulate disturbance regimes and succession response. Historically lands within a given vegetative response unit were subject to broadly similar disturbance regimes.
Water Quality Limited Segment	A stretch or area of surface water where technology-based controls are not sufficient to prevent violations of water-quality standards. In such cases, new permit limitations are based on ambient-water-quality considerations. See also, 303(d) segments.
Watershed	A geographic area of land, water, and biota within the confines of a drainage divide. The total area above a given point of a water body that contributes flow to that point.

Term	Definition
Watershed Condition Rating	The state of the watershed based on physical and biogeochemical characteristics and processes (such as, hydrologic, geomorphic, landscape, topographic, vegetative cover, and aquatic habitat), water flow characteristics and processes (such as volume and timing), and water quality characteristics and processes (such as chemical, physical, and biological) as they affect water quality and water resources. **Low:** Watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. The drainage network is generally stable. Physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems are predominantly functional in terms of supporting beneficial uses. **Moderate:** Watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. Portions of the watershed may exhibit an unstable drainage network. Physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems are at risk in being able to support beneficial uses. **High:** Watersheds exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. A majority of the drainage network may be unstable. Physical, chemical, and biologic conditions suggest that soil, riparian, and aquatic systems do not support beneficial uses.
Wetlands	Those areas that are inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances do or would support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds.
Wildfire	An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.
Wildland Fire	A general term describing any non-structure fire that occurs in the wildland. Two distinct types of wildland fire have been defined and include planned ignitions (prescribed fire) and natural, unplanned fire (wildfire). See also planned ignitions and natural, unplanned fire.

Term	Definition
Wildland Urban Interface (WUI)	The term "wildland urban interface" means either: (A) An area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan and/or under the "Healthy Forest Restoration Act"; or (B) In the case of any area for which a community wildfire protection plan is not in effect: (i) An area extending ½-mile from the boundary of an at-risk community; (ii) An area within 1½ miles of the boundary of an at-risk community, including any land that: (I) Has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community; (II) Has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or (III) Is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; and (iii) An area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuel reduction to provide safer evacuation from the at-risk community.
Winter Range	The area available to and used by wildlife (big game) during the winter season (Dec 1 to April 30). Generally, lands below 4,000 feet in elevation, on south and west aspects, that provides forage and cover.

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