USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Nez Perce-Clearwater National Forests R1-23-04 June 2023

Biological Assessment for Threatened, Endangered, Proposed Species, and Essential Fish Habitat Assessment

Nez Perce-Clearwater National Forests

Nez Perce-Clearwater National Forests Title Page: Photo Credit –. Top left, going clockwise – Fenn Ranger Station, Nez Perce National Forest; A group of plants with Kid Lake in the background, Clearwater National Forest; Leo Lake Area, Nez Perce-Clearwater National Forest; Indian Hill Lookout, Nez Perce-Clearwater National Forest; Orogrande Falls, Nez Perce-Clearwater National Forest

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Aquatic Species

Endangered Species Act effect determinations of the proposed framework programmatic action are **Likely to Adversely Affect** Bull Trout and their Critical Habitat; Snake River Steelhead and their Critical Habitat; Snake River Spring/Summer Chinook Salmon and their Critical Habitat; and Snake River Fall Chinook Salmon and their Critical Habitat.

Endangered Species Act effect determinations of the proposed framework programmatic action are **Not Likely to Adversely Affect** Snake River Sockeye Salmon or their Critical Habitat.

There are no Endangered Species Act effect determinations for Coho Salmon because they have been officially extirpated from the action area (i.e., Clearwater Basin; (Galbreath et al. 2014)). Hatchery-raised Coho Salmon have been reintroduced into some action area drainages but have not been listed under the Endangered Species Act.

Magnuson-Stevens Act effect determinations of the proposed framework programmatic action are **May Adversely Affect** essential fish habitat for Snake River Spring/Summer Chinook Salmon; Snake River Fall Chinook Salmon; and Coho Salmon.

Table 1. Summary of effect determinations for individuals and Critical Habitat listed under the Endangered Species Act (ESA) and Essential Fish Habitat listed under the Magnuson-Stevens Act (MSA).

Species	Listing Status	Individuals (ESA)	Critical Habitat (ESA)	Essential Fish Habitat (MSA)
Bull trout	Threatened	LAA	LAA	Not Applicable
Snake River Steelhead Trout	Threatened	LAA	LAA	Not Applicable
Snake River Spring/Summer Chinook Salmon	Threatened	LAA	LAA	MAA
Snake River Fall Chinook Salmon	Threatened	LAA	LAA	MAA
Snake River Sockeye Salmon	Endangered	NLAA	NLAA	Not Applicable
Hatchery Coho Salmon	Not Applicable	Not Applicable	Not Applicable	MAA

Plant Species

The implementation of the Forest Plan would contribute to the maintenance and restoration of habitat for Spalding's catchfly and result in a may affect, **Likely to Adversely Affect** determination. MacFarlane's four o'clock is not expected to inhabit the planning area but it does occur in adjacent areas. Because the species is not expected within the planning area, potential effects to the species are extremely unlikely to occur, and thus discountable. Therefore, with the implementation of the Forest Plan, our determination is no effect for MacFarlane's four o'clock. This species is not further addressed in this assessment.

Implementation of the Forest plan would contribute to the maintenance and restoration of whitebark pine on the Nez Perce-Clearwater National Forests and result in a may affect, **Likely to Adversely Affect** determination.

Federally Designated Species and Designated Critical Habitat

In accordance with section 7(c) of the Act, the U.S. Fish and Wildlife Service and National Marine Fisheries Service have determined that the following federally designated species may be present on the Nez Perce-Clearwater National Forests (Table 2) (11/01/2022). An updated list was obtained from the U.S. Fish and Wildlife Service's Idaho Fish and Wildlife Office via the Information for Planning and Consultation (IPaC) obtained on 6/2/2023, Project Code: 2023-0088941 (USFWS 2023):

Table 2. Federally designated species on the Nez Perce-Clearwater National Forests

Common Name	*Scientific Name*	Status[1]	Range
Bull Trout	*Salvelinus confluentus*	Threatened; Critical Habitat	Distributed throughout most large rivers and associated tributary systems within the Forests.
Spring/Summer Chinook Salmon	*Oncorhynchus tshawytscha*	Threatened; Critical Habitat; Essential Fish Habitat	Mainstem Snake River from its mouth to Hells Canyon Dam and all tributaries except the Clearwater River
Fall Chinook Salmon	*Oncorhynchus tshawytscha*	Threatened; Critical Habitat; Essential Fish Habitat	Mainstem Snake River from its mouth to Hells Canyon Dam and all tributaries except the North Fork Clearwater River above Dworshak Dam
Steelhead	*Oncorhynchus mykiss*	Threatened; Critical Habitat	Mainstem Snake River from its mouth to Hells Canyon Dam and all tributaries except the North Fork Clearwater River above Dworshak Dam
Sockeye Salmon	*Oncorhynchus nerka*	Endangered, Critical Habitat	Critical Habitat for Snake River Sockeye Salmon includes all reaches presently or historically accessible in the Columbia, Snake, and Salmon rivers and their tributaries upstream to Redfish Lake
Coho Salmon	*Oncorhynchus kisutch*	Essential Fish Habitat	Wild fish extirpated from the Forests; hatchery fish reintroduced into select Clearwater and Selway drainages

Common Name	*Scientific Name*	Status[1]	Range
Grizzly Bear	*Ursus arctos horribilis*	Threatened; No Critical Habitat Designated; Plan Area Contains Part of the Bitterroot Recovery Area	Transitory grizzly bears may be present in portions of the Plan Area. The Plan Area does not have a population of grizzly bears
Canada Lynx	*Lynx canadensis*	Threatened; No Critical Habitat Designated	Clearwater National Forest is occupied, Nez Perce National Forest is unoccupied. Transitory lynx may be present within any portion of the Plan Area
North American Wolverine	*Gulo gulo luscus*	Proposed Threatened; No critical habitat has been designated for this species.	Occupies the Nez Perce-Clearwater National Forests
Northern Idaho Ground Squirrel	*Urocitellus brunneus*	Threatened; No critical habitat has been designated for this species.	Does not occur on the Nez Perce-Clearwater National Forests (but does occur in Idaho County).
Spalding's Campion (or "catchfly")	*Silene spaldingii*	Threatened; No Critical Habitat Designated	Populations and suitable habitat occur in the lower Salmon River basin.
Macfarlane's Four-o'clock	*Mirabilis macfarlanei*	Threatened; No critical habitat has been designated for this species.	Thirteen populations of MacFarlane's four-o'clock are currently known. Three of these populations are found in the Snake River Canyon area (Idaho County, Idaho and Wallowa County, Oregon), seven in the Salmon River area (Idaho County, Idaho), and three in the Imnaha River area (Wallowa County, Oregon).
Whitebark Pine	*Pinus albicaulis*	Threatened; No Critical Habitat Designated	Distributed throughout the Forest in higher mountain and subalpine habitats.

[1]Endangered - Any species that is in danger of extinction throughout all or a significant portion of its range.

Threatened - Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range

Candidate - Those taxa for which the Service has sufficient information on biological status and threats to propose to designate them as threatened or endangered. We encourage their consideration in environmental planning and partnerships, however, none of the substantive or procedural provisions of the Act apply to candidate species

Critical Habitat - The specific area (i) within the geographic area occupied by a listed species, at the time it is listed, on which are found those physical or biological features (I) essential to conserve the species and (ii) that may require special management considerations or protection: and (iii) specific areas outside the geographic area occupied by the species at the time it is listed upon determination that such areas are essential to conserve the species

Essential Fish Habitat - Those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity

Proposed - Once a species is proposed, a year-long review period commences at the end of which the Service will make a final listing determination. Endangered Species Act regulation 50 C.F.R. 402.10(a) states: "Each Federal Agency shall confer with the Secretary on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed." Conferencing is not required for anything less than a jeopardy call, but conferencing or concurrence may be requested by the action agency

Introduction

This programmatic biological assessment evaluates and addresses the effects of implementing the revised Land Management Plan (hereinafter referred to as the "revised forest plan") on all threatened, endangered, and proposed species known or suspected to occur on the Nez Perce-Clearwater National Forests. For ease of discussion throughout this document, the Nez Perce-Clearwater National Forests will be referred to as "the Forest" when referencing the administrative units, the staff that administers the unit, or the National Forest System (NFS) lands within the unit.

Threatened, endangered, and proposed species are managed by the U.S. Fish and Wildlife Service and National Marine Fisheries Service (hereinafter referred to as the 'Service(s)') under the authority of the Endangered Species Act (PL 93-205, as amended) and by the U.S. Forest Service under the authority of the National Forest Management Act (PL 94-588). Section 7(a)(1) of the Endangered Species Act (ESA) of 1973 directs all Federal agencies to "utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act." Section 7(a)(2) of the ESA requires federal agencies to ensure that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any threatened, endangered, or proposed species or adversely modify its critical habitat. Additionally, the National Marine Fisheries Service manages Essential Fish Habitat (EFH) under the authority of Magnuson-Stevens Act where section 305(b)(2) states that "federal agencies must consult with NMFS regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that **May Adversely Affect** EFH" (50 CFR 600.920(a)(1)).

A biological assessment (hereinafter referred to as biological assessment or BA) must be prepared for federal actions (defined under NEPA as a project affecting the quality of the human environment) to evaluate the potential effects of the proposal on listed or proposed species and/or critical habitat (50 CFR 402.12(b)). The contents of the BA are at the discretion of the federal agency and will depend on the nature of the federal action (50 CFR 402.12(f)). The Forest Service also has direction in Forest Service Manual 2670 that guides habitat management for threatened, endangered, and proposed species. This document satisfies those requirements and also the Magnuson-Stevens Act requirement for EFH consultation pursuant to 50 CFR 600.920(f).

The forest plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out a project or activity (including ground-disturbing actions). As a result, it does not result in direct effects to fish, wildlife, or habitat. Each project conducted under the Nez Perce-Clearwater Forest Plan constitutes a federal action that must undergo site specific environmental analysis and Endangered Species Act/Magnuson-Sevens Act consultation before actions take place. Additional consultation occurs prior to when site-specific projects are implemented under the programmatic framework provided by the national forest plans. This consultation represents the first tier of a tiered consultation framework for the Forest. Each subsequent project that may affect federally listed species, as implemented under the revised forest plan, represents the second tier. When applicable, second-tier consultations would reference back to this programmatic consultation to ensure that effects of specific projects under consultation are commensurate with the effects anticipated in this assessment. Thus, this action approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time. Project or activity decisions will be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act would need to be conducted in order for prohibitions or activities to take place on the ground that are in compliance with the broader direction of the forest plan.

Eight primary decisions are made in forest plans:

1. Forestwide components to provide for integrated social, economic, and ecological sustainability, and ecosystem integrity and diversity while providing for ecosystem services and multiple uses. Components must be within Forest Service authority and consistent with the inherent capability of the plan area (36 CFR 219.7 and CFR 219.8–219.10).
2. Recommendations to Congress (if any) for lands suitable for inclusion in the National Wilderness Preservation System and/or rivers suitable for inclusion in the National Wild and Scenic Rivers System (36 CFR 219.7(2)(v) and (vi)).
3. Identification or recommendation (if any) of other designated areas (36 CFR 219.7 (c)(2)(vii).
4. Identification of suitability of areas for the appropriate integration of resource management and uses, including lands suited and not suited for timber production (36 CFR 219.7(c)(2)(vii) and 219.11).
5. Identification of the maximum quantity of timber that may be removed from the plan area (36 CFR 219.7 and 219.11 (d)(6)).
6. Identification of geographic or management area specific components (36 CFR 219.7 (c)(3)(d).
7. Identification of watersheds that are a priority for maintenance or restoration (36 CFR 219.7 (c)(3)(e)(3)(f).
8. Plan monitoring program (36 CFR 219.7 (c)(2)(x) and 219.12).

Plans include plan components (desired conditions, objectives, standards, guidelines, and suitability of uses) that influence the design and choice of future proposals for projects and activities in a plan area, and also include monitoring items. They provide additional definition of resource management activities needed to implement and achieve desired conditions and objectives and, through suitability determinations, standards, and guidelines, they establish constraints upon the decision space for on-the-ground management decisions.

Purpose and Need

The National Forest Management Act requires all national forests to develop plans that direct resource management activities. These plans must be revised when conditions have changed significantly or approximately every 15 years. The existing plans for the Nez Perce and Clearwater National Forests were completed in 1987 and have been amended many times. The Nez Perce and Clearwater National Forests were consolidated in 2013. The official name of the administratively combined forests is the Nez Perce-Clearwater National Forests. For the purposes of this document, the forests will be referred to as the Nez Perce-Clearwater or the “Forest”. Prior to the official combination, each forest had its own land management plan. Part of implementing the consolidation included a combined forest plan revision effort, which includes the preparation of a final environmental impact statement. Revised Forest Service policies, congressional direction, court decisions, new or updated conservation agreements and recovery plans, and new scientific findings have all highlighted that the current plans are outdated and need to be revised. The revised forest plan would provide direction for the management of the Forest by guiding programs, practices, uses, and projects. The purpose of the revised forest plan is to provide an integrated set of plan direction (or plan components) in accordance with the 2012 Planning Rule. The purpose of the proposed federal action is to revise the Nez Perce and Clearwater National Forest Land and Resource Management Plans (1987, as amended; hereinafter referred to as the “1987 forest plan”). The revised forest plan is expected to provide guidance for project- and activity-level decision making on the Forest for approximately the next 15 years.

Current forest plan monitoring, the 2014 Assessment, the 2014 Climate Change Vulnerability Assessment, and the 2011 Watershed Condition Assessment identify integrated restoration needs across the Nez Perce-Clearwater to address forest health, including resiliency to stressors, such as insects and disease, drought, and climate change; wildfire risk; aquatic and terrestrial wildlife habitat; invasive species; soil productivity and function; and road management. There is a need to revise the 1987 Forest Plans to emphasize integrated restoration of terrestrial and aquatic resources to restore vegetation composition, structure, and landscape patterns; reduce fuel loading; and improve watershed conditions to support wildlife and other resource values while contributing to the social and economic sustainability of local and regional communities.

The 2012 Planning Rule directs the Forest Service to manage National Forests for ecological, social, and economic sustainability. In addition, the rule considers the three as having equal importance in revising land management plans. There is a need to revise the 1987 Forest Plans to provide for ecological, social, and economic sustainability in an integrated manner. Additionally, the plans need to be revised to better consider multiple uses and ecosystem services desired by local, regional, and national publics.

In addition to updated planning regulations since development of the 1987 Forest Plans, laws and other regulations have changed and additional species have been listed as threatened or endangered under the Endangered Species Act. There is a need to revise the 1987 Forest Plans based on best available scientific information to update direction from the Inland Native Fish Strategy (INFISH) and Pacific Anadromous Fish Strategy (PACFISH) with forest-specific aquatic and riparian conservation strategies. In addition, there is a need to incorporate direction established in the Idaho Roadless Rule.

The purpose of actions under the guidance of the plan are to guide management toward the attainment of long-term desired conditions. Given the multiple resource nature of land management, the many types of projects, and the various activities that can occur over the life of the revised forest plan, it is not likely that a project or activity would maintain or contribute to the attainment of all desired conditions. Additionally, not all desired conditions are relevant to every activity (e.g., recreation desired conditions may not be relevant to a fuels treatment project). Most projects and activities are developed specifically to maintain or move conditions toward one or more of the desired conditions of the revised forest plan. It should not be expected that each project or activity would contribute to all desired conditions in a plan; usually it would contribute to one or a subset.

Regulatory Framework

Threatened, Endangered, and Proposed species; Critical Habitat; and Essential Fish Habitat are managed by the Forest Service in accordance with the National Forest Management Act of 1976 (PL 94-588), the Endangered Species Act of 1973 (PL 93-205, as amended); the Magnuson-Stevens Act of 1976 (PL 94-265, as amended), and the 2012 Planning Rule in accordance with the Policy associated with the implementation of these regulations. The National Forest Management Act requires forest plans to provide for multiple use and sustained yield of products and services in accordance with the Multiple-Use Sustained-Yield Act of 1960. Specifically, they include coordination of outdoor recreation, range, timber, watershed, wildlife, fish, and wilderness (Section 6(e)(1)).

The Endangered Species Act Section 7(a)(1) directs all federal agencies to use their authorities to conserve in consultation with the U. S. Fish and Wildlife Service. The Endangered Species Act Section 7(a)(2) requires federal agencies to ensure that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any threatened, endangered, or proposed species or adversely modify critical habitat. Federal agencies must review their actions to determine whether they may affect endangered or threatened species or critical habitat. To accomplish this, Federal agencies must determine whether any listed species may be present in the action area and whether that area overlaps with critical habitat. If one or more listed species may be present in the action area, or if critical habitat overlaps with the action area, agencies must evaluate the potential effects of their actions. The Endangered Species Act Section 9 prohibits the taking or possession of any endangered species of fish or wildlife.

Additionally, the National Marine Fisheries Service (NMFS) manages Essential Fish Habitat (EFH) under the authority of Magnuson-Stevens Act where section 305(b)(2) states that "federal agencies must consult with NMFS regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that May Adversely Affect EFH" (50 CFR 600.920(a)(1)).

The forest plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out a project or activity (including ground-disturbing actions). As a result, it does not result in direct effects to federally listed species. Each project conducted under the Forest plan constitutes a federal action that must undergo site specific environmental analysis and section 7 Endangered Species Act consultation before actions take place. Thus, additional site-specific consultation occurs prior to when projects are implemented under the programmatic framework provided by the national forest plans. The forest plan provides the framework and text guiding day-to-day resource management. It is strategic and programmatic and does not provide project-level decisions or result in irreversible or irretrievable commitments of resources. Project or activity decisions will be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act and Section 7 Consultation would need to be conducted in order for prohibitions or activities to take place on the ground that are in compliance with the broader direction of the forest plan.

This consultation represents the first tier of a tiered consultation framework for the Forest. Each subsequent project that may affect federally listed species, as implemented under the revised forest plan, represents the second tier. When applicable, second-tier consultations would reference back to this programmatic consultation to ensure that effects of specific projects under consultation are commensurate with the effects anticipated in this assessment. Thus, this action approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time.

The 2012 Planning Rule implements the requirements of the National Forest Management Act, the Endangered Species Act, as well as other legislation such as the Wilderness Act and the Wild and Scenic Rivers Act, through the establishment of forest plans. Section 219.8 of the Planning Rule requires plans to "provide for social, economic, and ecological sustainability within Forest Service authority and consistent with the inherent capability of the plan area."

Section 219.9 of the 2012 Planning Rule requires plans to provide for the diversity of plant and animal communities (36 CFR 219.9 (a)(1) and (b)(1)). To meet the requirements for plant and animal diversity, the rule calls for a complementary ecosystem and species-specific approach to forest management. It adopts a coarse filter-fine filter approach to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area. Consistent with the National Forest Management Act and the Endangered Species Act, Section 219.9 (a) of the 2012 Planning Rule requires that the plan must include plan components to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore their structure, function, composition, and connectivity (36 CFR 219.9(a)(1) and (2)). Ecosystem integrity is defined in the Planning Rule as:

> *"The quality or condition of an ecosystem when its dominant ecological characteristics (for example,*

composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence."

Section 219.9 (b) of the planning rule requires the deciding official to determine whether the ecosystem plan components outlined in Section 219.9 (a) would provide the ecological conditions necessary to contribute to the recovery of federally listed threatened and endangered species. If the responsible official determines that the plan components required in paragraph (a) are insufficient to provide such ecological conditions, then additional species-specific plan components, including standards or guidelines, must be included in the plan to provide such ecological conditions in the plan area (36 CFR 219.9(b)). Ecological conditions in the planning rule are defined as:

"The biological and physical environment that can affect the diversity of plant and animal communities, the persistence of native species, and the productive capacity of ecological systems. Ecological conditions include habitat and other influences on species and the environment. Examples of ecological conditions include the abundance and distribution of aquatic and terrestrial habitats, connectivity, roads and other structural developments, human uses, and invasive species."

Thus, the emphasis in the 2012 Planning Rule in providing for federally listed species is to provide ecological conditions needed for recovery with the emphasis on maintaining or restoring habitats through coarse filter ecosystem plan components first before adding species specific plan components.

Recovery, with respect to threatened or endangered species, is defined in the 2012 Planning Rule as:

"The improvement in the status of a listed species to the point at which listing as federally endangered or threatened is no longer appropriate."

The 2012 Planning Rule emphasizes the social and economic considerations in forest plans (36 CFR 219.10). Section 219.10 specifies that while meeting the requirements of 219.8, and 219.9, the plan must provide for ecosystem services and multiple uses, including outdoor recreation, range, timber, watershed, wildlife, and fish, within Forest Service authority and the inherent capability of the plan area.

The regulations guiding interagency cooperation under the Endangered Species Act (50 CFR § 402.02) define a *framework programmatic action* as a broad-scale plan that provides the framework for development of future action(s) that are authorized, funded, or carried out at a later time. An incidental take statement may be provided, recognizing that actual take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to their own future Section 7 consultation. This consultation on the forest plan fits the definition of a framework programmatic action. Section 305(b)(2) of the Magnuson-Stevens Act allows the Essential Fish Habitat Assessment to be grouped together with other such consultation (50 CFR 600.920(f)). All future projects or federal actions conducted under the guidance of the revised forest plan therefore will undergo additional environmental analysis and consultation under the Endangered Species Act and Magnuson-Stevens Act.

A forest plan, including amendments, identifies general land use purposes, suitability of uses, desired future conditions, objectives for resource conditions on specific lands, and standards and guidelines that restrict management activities needed to achieve desired conditions. The forest plan provides a programmatic framework for future site-specific decision making concerning all activities conducted and allowed on National Forest System lands. Therefore, the effects of a forest plan and amendments have no direct effects and occur later in time. As required by the National Forest Management Act, all resource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands must be consistent with the forest plan and amendments.

The 2012 Planning Rule requires forest plans to include certain types of components (see "Plan Components" section below) that must meet requirements within the rule for sustainability (36 CFR 219.8), plant and animal diversity (36 CFR 219.9), multiple uses (36 CFR 219.10), and timber (36 CFR 219.11).

The final directives for the 2012 Planning Rule states:

When designing plan components (ecosystem and species-specific) to provide for ecological conditions that contribute to the recovery of threatened and endangered species that occur within the plan area, the Interdisciplinary Team should:

- Consider conservation measures and actions identified in the recovery plan for each threatened and endangered species.
- Consider limiting factors (for example, naturally small and isolated populations, climate change) and key threats to each threatened and endangered species.
- Engage with the Services, as appropriate, in the evaluation of existing conditions for threatened and endangered species and in the development of plan components that contribute to their recovery.
- Work beyond the plan area boundary to collaborate and cooperate with the Services, states, tribes, other partners, landowners, and land managers to support an all-lands approach to species recovery.
- Support the reintroduction of listed species into historical habitat on National Forest System lands, where appropriate and consistent with recovery plan objectives.
- Engage with the Services, as appropriate, in the evaluation of any effects to aquatic threatened and endangered species downstream of the plan area that could be affected by actions within the plan area.
- Consider conservation measures and actions identified in the recovery plan for each threatened and endangered species.
- Consider limiting factors (for example, naturally small and isolated populations, climate change) and key threats to each threatened and endangered species.

The Forest Service Manual section 2670 contains additional guidance on the management of Federally listed species. Forest Service policy found within Forest Service Manual (FSM) 2676 provides species specific direction for grizzly bears, as listed below:

- Cooperate with state agencies, the U. S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, and other agencies and groups to carry out active programs to conserve the grizzly bear over the long term.
- Implement Forest Service commitments for the conservation of grizzly bears and their habitat through coordinated planning and management.
- Provide appropriate protection for individual grizzly bears that roam outside of delineated recovery zones and primary conservation areas. Work with the states to identify the areas where management for grizzly bears is biologically suitable and socially acceptable and coordinate management of nuisance bears.
- Establish and implement uniform planning and management procedures concerning grizzly bears and their habitat. These should include cumulative effects analysis processes, public information and education, sanitation, and management of unnatural foods, and coordinated management of motorized access.

- Establish and implement communication, education, assistance, and land management programs to eliminate preventable mortality of grizzly bears and minimize grizzly-human conflicts.
- Conduct multiple-use management of grizzly bear habitat in a manner that is compatible with the goal of grizzly bear conservation.
- Periodically monitor and report on habitat and population conditions and trends at appropriate spatial and temporal scales.

The FSM 2676 identifies the Grizzly Bear Recovery Plan and the Interagency Guidelines on Management of Grizzly Bear (Volume 51, Number 228 Federal Register 42863-42866, November 26, 1986) as guidance documents.

Section 2676a of the FSM for planning include the following direction:

- Collect, analyze, and display grizzly bear habitat information. Within a recovery area, delineate grizzly bear habitat into management situations, as described in the Interagency Grizzly Bear Guidelines. Within delisted populations, ensure that habitat monitoring, and analysis requirements established in the applicable conservation strategy are implemented.
- Identify appropriate management objectives and conservation measures for coordination of livestock grazing, timber management, recreation, and other land uses, as part of forest planning and project planning processes.
- Use a cumulative effects analysis process to estimate the possible impacts of land use activities on grizzly bear habitat and attainment of grizzly bear habitat management objectives, where appropriate.
- For listed populations, consult with the U.S. Fish and Wildlife Service as appropriate.

Use of the Best Available Scientific Information

This analysis used the best available scientific information (BASI) to inform the plan and analysis of effects. The directives for the 2012 Planning Rule provide guidance on identifying the best available scientific information. According to the directives, the best available scientific information is those that are reliable, accurate and relevant. While the BASI informs the planning process, plan components, and other plan content, it does not dictate what the decisions must be.

However, not all information used in the planning process should be considered to be scientific information. Of the scientific information there is a subset that is the BASI. The Responsible Official shall determine the BASI based on the following three criteria:

1. Accurate. To be accurate, the scientific information must estimate, identify, or describe the true condition of its subject matter. This description of the true conditions may be a measurement of specific conditions, a description of operating behaviors (physical, biological, social, or economic), or an estimation of trends. Statistically accurate information is near to the true value of its subject, quantitatively unbiased, and free of error in its methods.

The extent to which scientific information is accurate depends on the relationship of the scientific findings to supportable evidence that identifies the relative accuracy or uncertainty of those findings. The accuracy of scientific information can be more easily evaluated if reliable statistical or other scientific methods have been used to establish the accuracy or uncertainty of any findings relevant to the planning process.

2. Reliable. Reliability reflects how appropriately the scientific methods have been applied and how consistent the resulting information is with established scientific principles. The scientific information is more reliable if it was resulted from an appropriate study design and well-developed scientific methods that are clearly described. The assumptions, analytical techniques, and conclusions are well referenced with citations to relevant, credible literature, and other pertinent existing information. The conclusions presented are based on reasonable assumptions supported by other studies and consistent with the general theory underlying those assumptions or are logically and reasonably derived from the data presented. Any gaps in information and inconsistencies with other pertinent scientific information are adequately explained.

Scientific information that describes statistical or other scientific methods used to determine both its accuracy and uncertainty can be considered to be more reliable. The use of quantitative analysis that has known (and quantifiable) rates of errors and results improves this reliability. An accuracy assessment of the data supports the reliability of the quantitative analysis.

The application of quality control to the scientific information also improves the reliability of the information. One form of quality control is peer review when scientific information has been critically reviewed by qualified scientific experts in that discipline and the criticism provided by the experts has been addressed by the proponents of the information. Publication in a refereed scientific journal usually indicates that the information has been appropriately peer reviewed.

3. Relevant. The information must pertain to the issues under consideration at spatial and temporal scales appropriate to the plan area and to a land management plan. Relevance in the assessment phase is scientific information that is relevant to providing information, including conditions and trends, about the 15 topics in 36 CFR 219(b) or to the sustainability of social, economic, or ecological systems (36 CFR 36 219.5(a)(1)). Relevance in the planning phase is scientific information pertinent to the plan area or issues being considered for the development of plan components or other plan content.

This biological assessment uses the best available scientific information to understand the biology of the species analyzed and inform the analysis of the effects of the revised forest plan.

Action Area

The Nez Perce-Clearwater is located in the heart of north-central Idaho, in a seven-county region comprising Idaho, Clearwater, Latah, Shoshone, Benewah, Lewis, and Nez Perce counties as shown in Figure 1. The plan area encompasses six ranger districts: Palouse, North Fork, Lochsa-Powell, Moose Creek, Salmon River, and Red River. The Nez Perce-Clearwater is responsible for managing approximately four million acres across this landscape. The Clearwater River drains most of these acres within both forests and rugged mountain ranges, pristine rivers and streams, and extensive forested landscapes combine to create diverse ecosystems that provide spectacular recreational opportunities; substantial fish and wildlife habitat; and forest, minerals, and range products.

The landscape of the Nez Perce-Clearwater is characterized by deep, rugged river canyons surrounded by either rolling hills or steep jagged mountains. Mixed conifer forests interspersed with small but distinctive open meadows, grasslands, and pockets of deciduous trees and shrubs comprise most of the vegetative cover. Rivers, lakes, and streams are often framed by lush riparian vegetation. Western redcedar, western larch, western hemlock, Douglas-fir, grand fir, lodgepole pine, and ponderosa pine are the dominant conifer species, which drape the canyon walls and stretch to the uplands. Historically, western white pine and whitebark pine were found throughout the area. Disturbance in the form of wildland fire, landslides, and insect and disease are continually cycling through the landscape. These natural processes create a patchwork of openings with vegetation at all age classes found across the Nez Perce-Clearwater.

The rich heritage of the area is still visible. Use and inhabitation of the area by Indigenous people dates back for millennia and the Nez Perce-Clearwater has been the home of the Nez Perce Tribe for centuries. Early travelers used routes through the Bitterroot Mountains to explore the far reaches of the country. These events have been remembered through the designation of the Lolo Trail Historic Landmark corridor and other historic routes that bisect the Nez Perce-Clearwater. Historic mining towns, log cabins, Forest Service facilities, wagon roads, and fire lookouts dot the landscape, adding to the unique scenic character of the area.

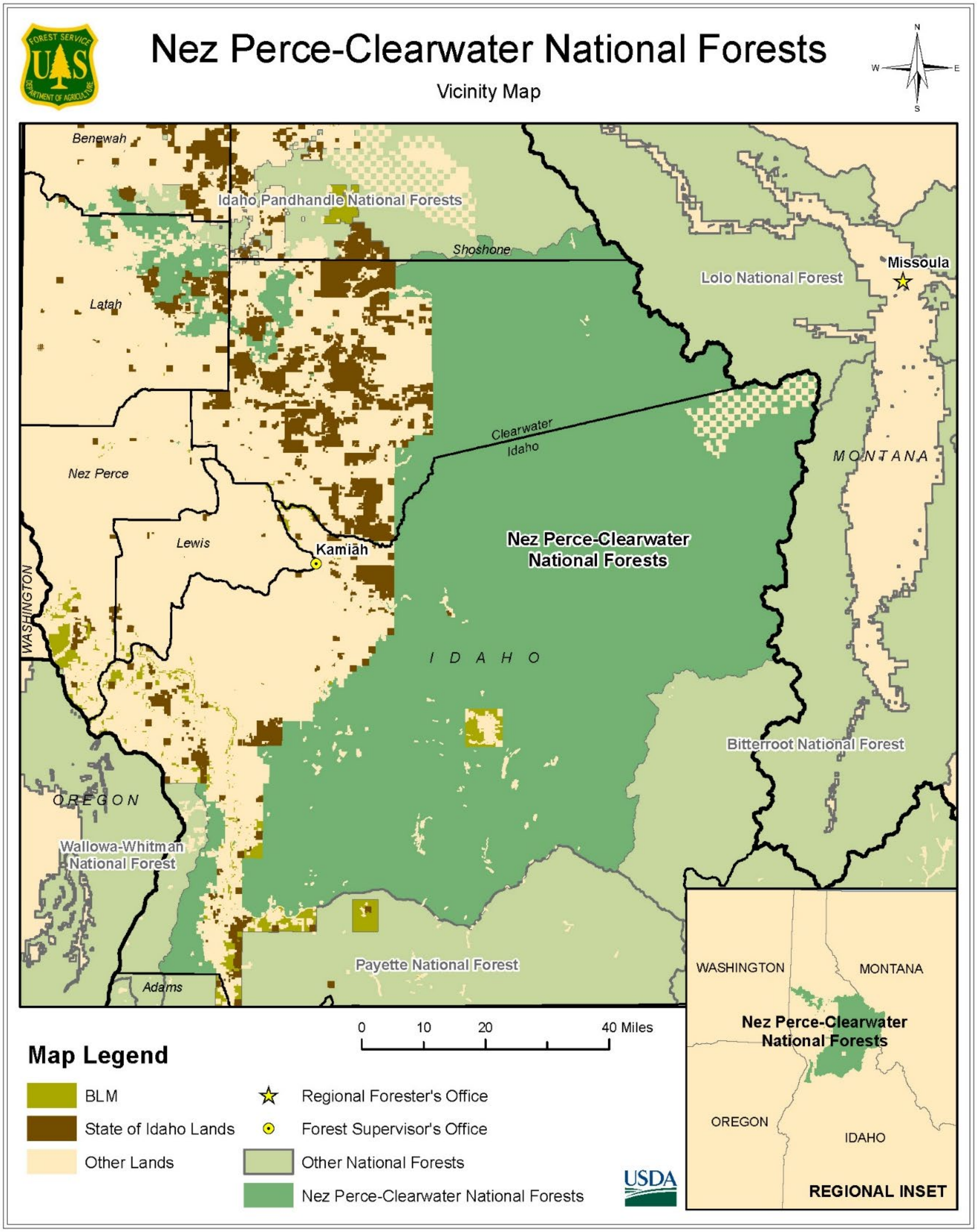

Figure 1. Vicinity Map of Nez Perce-Clearwater National Forests

Consultation History

The Nez Perce-Clearwater National Forests have had open communication regarding consultation with U.S. Fish and Wildlife Service and National Marine Fisheries Service. Informal consultation began with early conversations on the proposed action. Initially these conversations were with both the U.S. Fish and Wildlife Service and the National Marine Fisheries Service regarding the development of plan components for the aquatic and riparian portions of the plan. The State of Idaho Fish and Game and Nez Perce Tribe were also involved in this effort. A working group was established and met frequently (approximately bimonthly) between 2018 and 2019. The supervisors of the working group, called the Supervisor's group, met less regularly during this time, approximately six times total. By late 2019 and early 2020, the working group had reached consensus on the plan components it was able, and the remaining decisions were elevated to the Supervisor's group. Discussions with the Supervisor's group continued into 2021. By 2022, a final decision had been made on all aquatic and riparian plan components.

Consultation on wildlife and plant species with the U.S. Fish and Wildlife Service began in 2019 with informal discussion regarding how the revised forest plan was going to support recovery of listed species. Lynx consultation proceeded under the Northern Rockies Lynx Management Direction (NRLMD) framework. Consultation on botanical species was initiated in this time frame. Grizzly bear consultation began in 2020 and quickly resulted in Level 2 discussions. Level 2 agreed upon a comprehensive grizzly bear strategy for the plan in early 2022 and these modified plan components and potential management approaches were given to the level 1 team for incorporation in the BA analysis.

Work on the biological assessment began in 2019. First drafts were transmitted in 2021 and weekly meetings began at that time. In the Spring of 2022, a second version of the BA was transmitted for review. At this time the meetings transitioned to biweekly meetings. An initial final version was transmitted in November 2022. Following a review, both the FWS and NMFS requested additional discussion on the action and the analysis. The USFS Northern Region Regional Office, the NMFS West Coast Regional Office and FWS Northern Idaho Office formed a Senior Management Group to discuss outstanding questions and resolve issues. This group met regularly between February and May 2023. By June 1, 2023, this group agreed that we had reached closure on the BA and the Forest was asked to resubmit the BA as a second version for acceptance and to initiate a Biological Opinion.

Programmatic Decision

The revised forest plan is programmatic in scope. It provides the framework for future site-specific actions that are subject to section 7 consultation but does not authorize, fund, or carry out future site-specific actions. Future project-level activities must be consistent with the direction in the revised forest plan and must undergo their own National Environmental Policy Act (NEPA) planning and decision-making procedures, including the appropriate Endangered Species Act (ESA) section 7 consultation. The management direction contained in the revised forest plan will go into effect 30 days after the final record of decision is signed by the Forest Supervisor.

Consistency with the Plan

As required by the National Forest Management Act, all projects and activities authorized by the Nez Perce-Clearwater must be consistent with the forest plan (16 USC 1604 (i)), per 36 CFR 219.15. This is accomplished by a project or activity being consistent with all applicable plan components.

Projects and activities authorized after approval of a plan, plan amendment, or plan revision must be consistent with the plan as provided in 36 CFR 219.15, paragraph (d) as follows:

Every project and activity must be consistent with the applicable plan components. A project or activity approval document must describe how the project or activity is consistent with applicable plan components developed or revised in conformance with this part by meeting the following criteria:

> **Goals, desired conditions, and objectives**. The project or activity contributes to the maintenance or attainment of one or more goals, desired conditions, or objectives, or does not foreclose the opportunity to maintain or achieve any goals, desired conditions, or objectives, over the long term.
>
> **Standards:** The project or activity complies with applicable standards.
>
> **Guidelines:** The project or activity:
>
> > Complies with applicable guidelines as set out in the plan;
> >
> > Or is designed in a way that is as effective in achieving the purpose of the applicable guidelines (§219.7(e)(1)(iv)) (4)
>
> **Suitability:** A project or activity would occur in an area:
>
> > That the plan identifies as suitable for that type of project or activity; or
> >
> > For which the plan is silent with respect to its suitability for that type of project or activity.

Any resource plans (for example, travel management plans) developed by the Forest Service that apply to the resources or land areas within the planning area must be consistent with the plan components. Resource plans developed prior to plan decision must be evaluated for consistency with the plan and amended if necessary.

The project documentation will include a finding that the project is consistent with the forest plan's desired conditions or objectives and briefly explain the basis for that finding. When a categorical exclusion applies and there is no project decision document, the finding and explanation will be in the project record (FSH 1909.12 22.35a).

The project documentation must confirm that the project is consistent with applicable standards. Deviation from standards requires an amendment to the plan.

The project documentation will describe how the project is consistent with the applicable guideline(s). When the project design varies from the exact wording of a guideline, project documentation must specifically explain how the project design is as effective in meeting the purpose of the guideline. Under this circumstance, a plan amendment is not required. However, if a project or activity is not designed to meet the purpose of a guideline, an amendment to the plan is required.

Hierarchy of Plan Guidance

If conflicting plan guidance is discovered, the guidance for the most restrictive land allocation should be applied.

Proposed Action

The proposed action is to implement the Preferred Alternative analyzed in the Final Environmental Impact Statement. This alternative was developed following the comment period on the draft environmental impact statement. This alternative integrates concerns from the public and attempts to find balance and compromise with the major issues. This alternative responds to public comments and is a compilation of portions of all other alternatives analyzed in detail in the draft environmental impact statement. The Preferred Alternative integrates ecological, social, and economic sustainability while responding to both local and national interests.

The revised forest plan would provide direction for the management of the Forest by guiding programs, practices, uses, and projects. The purpose of the revised forest plan is to provide an integrated set of plan direction (or plan components) in accordance with the 2012 Planning Rule. The revised plan determines land allocations, including management areas, geographic areas, recommended wilderness, and eligible or suitable wild and scenic rivers; suitability of uses; plan components to guide future projects within these land allocations; determine priority watersheds; and establish a monitoring plan. While many activities are likely to occur under the revised plan, those activities are subject to additional environmental analysis, documentation, and section 7 consultation, if applicable. This plan does not authorize any action on the ground.

Plan component definitions

Plan components guide future projects and activities and the plan monitoring program. Plan components are not commitments or final decisions approving projects or activities. Some plan components have also been designed to address drivers and stressors of ecosystems.

Plan components include desired conditions, objectives, standards, guidelines, suitability, and monitoring questions with monitoring indicators. Plan components have been given alpha-numeric identifiers for ease in referencing within the forest plan. The identifiers include:

- The level of direction (e.g., forestwide = FW, management area = MA, or geographic area = GA; note that with management area or geographic area direction, the management area number and the geographic area acronym are also included);
- The type of direction (where DC = desired condition, OBJ = objective, STD = standard, GDL = guideline, SUIT = suitability, MON = monitoring question, IND = monitoring indicator);
- The resource (for forestwide direction), e.g., WTR = watersheds; T = terrestrial ecosystems; and V = vegetation; and
- a unique number (i.e., numerical order starting with “01”).

Thus, forestwide direction for desired conditions associated with watersheds would be identified starting with FW-DC-WTR-01. The identifiers are included as part of the headings in chapters 2 through 4 of the revised forest plan with the unique number preceding each plan component.

The full set of plan components for the revised forest plan, final environmental impact statement version, are in Appendix B. Land Management Plan (Proposed Action).

Following are the definitions and, where necessary, a description of the context of the required plan components (36 CFR 219.7(e)).

Desired conditions

A desired condition is a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined but must not include completion dates (36 CFR 219.7(e)(1)(i)). Desired conditions are not commitments or final decisions approving projects and activities. The desired condition for some resources may currently exist, but for other resources they may only be achievable over a long time period.

This plan presents three types of desired conditions, as follows:

- Forestwide desired conditions apply across the landscape but may be applicable to specific areas as designated on a map.
- Management area desired conditions are indications of what future conditions would typically be desired within that management area. In the revised forest plan, these are desired conditions that apply within one of the three broad management areas indicated by the prefix of the plan component alpha-numeric identifier. For example, MA2-DC-WL-01 would indicate that the plan desired condition applies only in Management Area 2.
- Geographic area desired conditions are specific to an area or place and reflect community values and local conditions within the area. They do not substitute for or repeat forestwide desired conditions. These desired conditions allow us to focus on specific circumstances in specific geographic locations. The Forest plan contains desired conditions and other plan components for 4 limited geographic areas.

Objectives

An objective is a concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonably foreseeable budgets (36 CFR 219.7(e)(1)(ii)). Objectives describe the focus of management in the plan area within the plan period. Objectives will occur over the life of the forest plan, considered to be over the first 15 years of plan implementation, unless otherwise specified. Objectives can be forestwide or specific to management areas or geographic areas.

It is important to recognize that objectives were developed considering historic and expected budget allocations as well as professional experience with implementing various resource programs and activities. It is possible that objectives could either exceed or not meet a target based upon a number of factors, including budget and staffing increases or decreases, increased or decreased planning efficiencies, and unanticipated resource constraints.

Goals

A plan may include goals as plan components. Goals are broad statements of intent, other than desired conditions, usually related to process or interaction with the public, or in meeting common interests with other partners or government agencies. Goals are expressed in broad, general terms, but do not include completion dates.

Standards

A standard is a mandatory constraint on project and activity decision-making, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iii)). Standards can be developed for forestwide application or be specific to a management area or geographic area.

Guidelines

A guideline is a constraint on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met. Guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iv)). A guideline can be forestwide or specific to a management area or a geographic area.

Suitability of lands

Specific lands within the Forest are identified as suitable for various multiple uses or activities based on the desired conditions applicable to those lands. The plan identifies lands within the Forest as not suitable for uses that are not compatible with desired conditions for those lands. Suitability is not identified for every use or activity following guidance provided at 36 CFR 219.7 (e)(1)(v)).

The identification of suitability of lands for a particular use in the forest plan indicates that the use may be appropriate but does not make a specific commitment to authorize that use. If certain lands are identified as not suitable for a use, then that use, or activity may not be authorized and would thus be prohibited. Thus, suitability plan components are a mechanism to provide constraints on non-suitable activities where indicated. Prohibiting an existing or authorizing a new use requires subsequent, site-specific NEPA analysis. Generally, the lands on the Forest are suitable for uses and management activities appropriate for national forests, such as outdoor recreation or timber, unless identified as not suitable.

The plan makes suitability determinations on the following activities: timber production, timber harvest, permanent road construction, temporary road construction, prescribed fire, livestock grazing, mineral-locatable, minerals-leasable, minerals- salable, new facilities, motorized recreation, over-snow motorized recreation, and mechanical transportation. Suitability determinations are made for each of these activities within each of the following areas: the Lolo Trail National Historic Landmark, wilderness areas, recommended wilderness, designated wild and scenic rivers, suitable wild and scenic rivers, Idaho Roadless Rule areas, Recreation Opportunity Spectrum settings, riparian management zones, mass movement areas, municipal watersheds, developed recreation sites, administrative sites, and Research Natural Areas.

Suitability determinations are identified in the plan in the following chapters and sections: Sustainable Recreation Management Section 4.3, Suitability Section 4.9, Timber Section 5.1, Designated Wilderness Areas Section 5.5.1, Designated Wild and Scenic Rivers Section 5.5.2, Recommended Wilderness Areas Section 5.6.1, Eligible and Suitable Wild and Scenic Rivers Section 5.6.2, Idaho Roadless Rule Section 5.6.3, Research Natural Areas Section 5.6.4, and the Lolo Trail National Historic Landmark Geographic Area 5.7.4. Refer to Appendix B. Land Management Plan (Proposed Action) for applicable plan components.

Management, geographic, and designated areas

Every plan must have management areas or geographic areas or both. The plan may identify designated or recommended designated areas as management areas or geographic areas (36 CFR 219.7(d)). These areas are assigned sets of plan components such as desired conditions, suitable uses, and in some areas either standards or guidelines or both. Geographic area desired conditions describe what we want to achieve in specific geographic areas that are not necessarily covered by forestwide desired conditions. Although all resources have been considered, the only desired conditions specified for a geographic area are those that are not adequately addressed by forestwide desired conditions.

Designated areas or features are identified and managed to maintain their unique special character or purpose. Some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch. Examples of statutorily designated areas are national heritage areas, national recreational areas, national scenic trails, inventoried roadless areas, wild and scenic rivers, wilderness areas, and wilderness study areas. Examples of administratively designated areas are experimental forests, research natural areas, scenic byways, botanical areas, and significant caves (36 CFR 219.19).

Management areas and geographic areas are spatially identified areas within the Nez Perce-Clearwater. These areas are assigned sets of plan components, such as desired conditions, suitable uses, and in some areas either standards or guidelines, or both.

Management Areas in 1987 Plans

The 1987 Nez Perce Plan divided the Forest into 22 different management areas, each with their own set of plan components. Similarly, the 1987 Clearwater Forest plan had 17 Management areas. Part of the purpose and need of the Revised Forest Plan is to establish a consistent framework for the management of the combined forests. The Proposed Action would establish a consistent and simplified framework for the management of the forests that are now administratively combined and uses three overarching management areas, under which nine subcategories are delineated. For comparison purposes the management areas from the 1987 plans have been combined in a way that best represents the management areas of the proposed action and the acres are compared in the BA introduction. The land allocation in the revised forest plan will change management areas and is part of the proposed action.

The revised forest plan will change the allocation of management areas and management area emphasis. It will also simplify management into three management areas, each with unique management emphasis. They are further subdivided into sub-management areas (table 4). Under the proposed action, designated areas are managed under Management Area 1. These include Designated Wilderness, Designated Wild and Scenic Rivers, and the National Historic Landmark. Management Area 2 consists of Idaho Roadless Rule Areas and proposed areas such as recommended wilderness, suitable wild and scenic rivers, designated and proposed Research Natural Areas, and the Gospel Hump area. Areas outside of designated and propose areas are managed for multiple uses and are called Management Area 3. These areas are commonly referred to as the managed front or front country. The managed front typically includes more roads, the majority of the campgrounds, more human use, and is managed for timber production.

Management Area 1: Wilderness, Wild and Scenic Rivers, and National Historic Landmark Areas

Management Area 1 is comprised of protected areas with national designations. This management area consists of three sub-categories, each with their own specific management direction. The sub-categories include designated wilderness, designated wild and scenic rivers, and National Historic Landmarks. Components specific to Management Area 1 are coded as “MA1.”

Management Area 2: Backcountry

Management Area 2 includes lands within Idaho Roadless Rule areas, recommended wilderness areas, suitable wild and scenic rivers, parts of the Gospel-Hump Geographic Area, and proposed and designated research natural areas. This management area is made up of relatively large areas, generally without roads, and provides a variety of motorized and non-motorized recreation opportunities. Trails are the primary improvements constructed and maintained for recreation users. In some areas, lookouts, cabins, or other structures are present, as well as some evidence of management activities. Components specific to Management Area 2 are coded “MA2.”

Recommended Wilderness

Three recommended wilderness areas (RWAs) would be included in the Preferred Alternative, including parts of four Idaho Roadless Rule areas – Hoodoo, Mallard-Larkins, East Meadow Creek, and West Meadow Creek. The Meadow Creek Recommended Wilderness Area would be a new recommended wilderness area from the No Action Alternative. The Hoodoo and Mallard-Larkins RWAs have been modified in their spatial extent from the No Action Alternative of the 1987 forest plans. In total, the Preferred Alternative includes 258,210 acres of recommended wilderness.

Eligible and Suitable Wild and Scenic Rivers

While the revised forest plan won't change designated wild and scenic rivers, it will identify rivers as eligible or suitable for consideration for future designation. The 1987 forest plans identified 29 eligible rivers, including their river corridor of ¼ mile surrounding the river, and were managed to maintain their outstandingly remarkable values.

The Forest Plan interdisciplinary team looked at all named rivers on the Forests and made new eligibility determinations. Eighty-eight rivers on the Nez Perce-Clearwater were found to be free flowing and have outstandingly remarkable values. These rivers are all eligible as potential Wild and Scenic rivers. As the Wild and Scenic Rivers eligibility process does not vary by alternative, the Nez Perce-Clearwater was asked to complete a suitability study to determine which rivers would be suitable for inclusion in the Wild and Scenic Rivers System. Once a wild and scenic rivers suitability study is complete, eligible rivers found not suitable need not be managed under interim protection measures (Forest Service Handbook 1909.12). Rather, they are managed under the guidance of the forest plan with whatever guidance would otherwise apply. Fifty-two eligible river segments were found not to be suitable following completion of the handbook process for determining suitability. The proposed action found eleven rivers suitable and one eligible for inclusion in the Wild and Scenic River system. A comparison of the proposed action and the existing condition is shown in Table 3.

Table 3. A comparison of the eligible and suitable wild and scenic rivers under the 1987 plans and the proposed action

Wild and Scenic Suitable Rivers	Existing Condition – Eligible rivers under the 1987 plans	Proposed Action – Rivers found suitable or that would remain eligible under the revised forest plan
Rivers	0 suitable, 29 Eligible: Bargamin Creek; Bear Creek Complex (Bear, Brushy Fork, Cub, Paradis, Wahoo); Cayuse Creek; Fish Creek; Hungery Creek; Johns Creek; Kelly Creek; Lake Creek; Little North Fork Clearwater River; Meadow Creek (Selway); Moose Creek Complex (East Fork Moose, Moose, North Fork Moose, West Fork Moose Creek, Rhoda); North Fork Clearwater River; Running Creek; Salmon River; Slate Creek; South Fork Clearwater River; Three Links Creek Complex (Three Links, West Fork Three Links); West Fork Gedney Creek; White Bird Creek; White Sand Creek (renamed Colt Killed Creek)	11 Suitable: Cayuse Creek, Fish Creek, Hungery Creek, Weitas Creek, Kelly Creek, North Fork Kelly Creek, Middle Fork Kelly Creek, South Fork Kelly Creek, Colt Killed Creek, Meadow Creek and the Salmon River. 1 Eligible: Little North Fork

Management Area 3: Front Country

The rest of the Nez Perce-Clearwater comprises Management Area 3. Most of this management area consists of the areas with roads, trails, and structures, as well as signs of past and ongoing activities designed to actively manage the area. This management area includes parts of the Gospel-Hump Geographic Area and proposed and designated special areas. This management area provides a wide variety of recreation opportunities, both motorized and non-motorized. Components specific to Management Area 3 are coded "MA3." No chapter with direction specific to Management Area 3 is presented because all forestwide direction applies, as well as direction in Chapter 2 organized by resource area with the "MA3" label.

Geographic Area: Gospel-Hump

The Endangered American Wilderness Act (1978) divided the roadless area, formerly known as the Gospel-Hump area, into three portions. The largest portion, consisting of 206,000 acres, became wilderness; another portion, comprising 45,000 acres, became available for immediate development; and a third portion, including three areas totaling 92,000 acres referred to as the Gospel-Hump Multi-Purpose Area, was designated for multiple purpose resource development. Section Four of the Endangered American Wilderness Act directed the completion of the Gospel-Hump Multi-Purpose Plan, which was completed in 1985 and incorporated into the 1987 Nez Perce Forest Plan. The Endangered American Wilderness Act provides for periodic updates to this multi-purpose plan. The development of this geographic area fulfills that legislative intent and would replace the direction for the area found in the Gospel-Hump Multipurpose Resource Development Plan and the 1987 Nez Perce National Forest Land Management Plan.

Geographic Area: Lower Salmon River

The lower Salmon River area contains rich geological complexity contributing to a biological community that is unique within the plan area. This geographic area contains a large portion of the driest areas within the warm, dry potential vegetation group dominated by ponderosa pine under a frequent low intensity fire system. These habitats support species associated with ponderosa pine dominated habitats, including several species of conservation concern.

Geographic Area: Pilot Knob

The Pilot Knob geographic area, known as “T’amloyiitsmexs” by the Nez Perce, is a very important cultural and sacred site to the Nez Perce Tribe. T’amloyiitsmexs is a significant landmark used by the Nez Perce for “weyekin,” or spiritual quests. Pilot Knob has a significant historic meaning with respect to the Nez Perce religious values and weyekin practices that have been used from time-immemorial and remains to be respected and used by Nez Perce tribal members. Per the Nez Perce Tribal Executive Committee, these tribal religious rites can be conducted in no other place. The Nez Perce Tribe strives to maintain its cultural and traditional practices and to keep alive the knowledge of the beliefs and interpretations of such values. Because of its elevation and central location, Pilot Knob started being used as a site to locate communication equipment in 1977 with issuance of a communication use permit to the State of Idaho Military Division Public Safety Communications Unit. By 1988, the Nez Perce Tribal Executive Committee described that most of Pilot Knob’s features had been altered, defaced, or destroyed by man-made devices. The Pilot Knob geographic area is also an Idaho Roadless Rule area with a “Special Areas of Historic or Tribal Importance” theme.

Geographic Area: Lolo Trail National Historic Landmark

The Lolo Trail, a National Historic Landmark administered in cooperation with the National Park Service, is part of the Nez Perce National Historical Park. The trail extends through the Nez Perce-Clearwater from Lolo, Montana, to Weippe, Idaho.

The Lolo Trail National Historic Landmark was designated in 1963. Its three-fold significance lies in its roots as an ancient American Indian trail. This trail comprises the route Lewis and Clark traveled from 1805 to 1806, as well as the path taken by the Nez Perce Indians during the Nez Perce Indian War of 1877. The landmark stretches about 62 miles from the Nez Perce-Clearwater boundary near Musselshell Meadows to the Nez Perce-Clearwater boundary near Lolo Pass.

The Lolo Trail National Historic Landmark is a geographic area and also part of Management Area 1 as a congressionally designated landmark.

Aquatic and Riparian Management

The Proposed Action carries concepts and most components from PACFISH/INFISH forward into the revised plan. Where there are slight differences, they occur because of changes required by 2012 Planning Rule, as well as advances in best available science information.

The revised forest plan proposes to maintain the use of PACFISH and INFISH Biological Opinion (PIBO) monitoring data or an equivalent collected at a subset of sites on the Forest every year so that progress towards desired conditions can be determined. While the revised forest plan does not contain numerical Riparian Management Objectives like PACFISH/INFISH did, descriptive desired conditions contained in the revised forest plan would be used to guide project location, development, and actions. Because of the lag time between projects and effects, as well as the variability that can result from localized weather events, PIBO data analyzed at the subbasin scale and Forest-scale is a rigorous method to ascertain whether plan components designed to protect and restore the aquatic environment are effective. All this information will enable the Forest to adapt its management strategies and adjust decisions in the future, if needed, based upon what has been learned.

Another change is the inclusion of a multi-scale analysis strategy as other plan content (Appendix A: Potential Management Approaches).

Aquatic Potential Management Approaches and Multiscale Analysis). Multi-scale analysis, a refinement of watershed analysis, has been a widely applied methodology that was first required for use by the U.S. Forest Service in the Pacific Northwest Region (Henjum et al. 1994). It was also described and recommended for use in the interior Columbia Basin key and priority watersheds by PACFISH and INFISH Strategies (U.S. Department of Agriculture 1995b) and is recommended for inclusion in plan revisions by the Interior Columbia Basin Ecosystem Management Project strategy (U.S. Department of Agriculture and U.S. Department of the Interior 2014). The multi-scale analysis strategy included in Appendix A: Potential Management Approaches.

Appendix A: Potential Management Approaches describes some of the possible actions and potential management approaches and strategies the Nez Perce-Clearwater might undertake to maintain or make progress towards achieving the desired conditions described in the revised forest plan. It is also intended to help clarify how the planned outcomes (i.e., objectives, desired conditions) in the revised forest plan might be achieved. The potential management approaches included here may be used to inform future proposed and possible actions. It does not serve as a “to do list” of projects; it does not suggest expected locations or dates of implementation; and it is not an all-inclusive list.

This appendix provides information by individual resource areas that is intended to clarify the intent and provide suggested means to achieve specific direction and components related to each resource area of the revised forest plan. Potential management approaches and strategies presented in this section may include suggestions for on-the-ground implementation, analysis, assessment, inventory, or monitoring, as well as partnership and coordination opportunities the Nez Perce-Clearwater is suggesting might be helpful in achieving its desired conditions. The potential approaches and strategies are not intended to be all-inclusive, nor are they commitments to perform specific actions. The types of actions that are exemplified in this appendix do not commit the Nez Perce-Clearwater to perform or permit these actions but are provided as actions that would likely be consistent with plan components and that might be undertaken to maintain or move towards the desired conditions and objectives. Although the purpose and need developed for a specific project may address one or more desired conditions identified in the revised forest plan, each individual desired condition would not need to be met on every project nor in every treatment area within a project.

The revised forest plan employs a strategy of adaptive management in its decision making and achievement of the plan's desired conditions and objectives. An adaptive management strategy emphasizes the learning process. It involves using the best current knowledge to design and implement management actions, then monitoring and evaluating results and adjusting future actions based on what has been learned. This is a reasonable and proactive approach to decision making considering the degree of uncertainty in future ecological, social, and economic factors. Appendix A: Potential Management Approaches describes potential management approaches and possible actions that are optional content in the revised forest plan. Forest plans may include optional content such as potential management approaches, strategies and partnership opportunities, or coordination activities (36 CFR 219.7(f)(2)).

Aquatic Potential Management Approaches and Multiscale Analysis has been simplified and clarified to sharpen focus on necessary integration.

Riparian Management Zones

The revised forest plan would establish riparian management zones (RMZs) to protect or improve riparian health near streams. Proposed RMZ distances would be equal to, or slightly more conservative than, PACFISH/INFISH riparian habitat conservation area (RHCA) buffers (FW-STD-RMZ-07):

Category 1 - Fish-bearing streams: Riparian Management Zones consist of: the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge; or to the outer edges of the 100-year floodplain; or to the outer edges of riparian vegetation; or to a distance equal to the height of two site-potential trees; or 300 feet slope distance equaling 600 feet total, including both sides of the stream channel; whichever is greatest. If a stream contains fish at any time of the year, then this riparian management zones definition would be applied to that stream.

Category 2 - Permanently flowing non-fish bearing streams: Riparian Management Zones consist of: the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge; or to the outer edges of the 100-year floodplain; or to the outer edges of riparian vegetation; or to a distance equal to the height of one site-potential tree; or 150 feet slope distance equaling 300 feet total, including both sides of the stream channel; whichever is greatest.

Category 3 - Constructed ponds and reservoirs, and wetlands greater than one acre: Riparian Management Zones consist of: the body of water or wetland and the area to the outer edges of the riparian vegetation; or to the extent of seasonally saturated soil; or the extent of unstable and potentially 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 wetland greater than one acre; or the maximum pool elevation of constructed ponds and reservoirs; whichever is greatest.

Lakes and natural ponds: Riparian Management Zones consist of: the body of water and the area to the outer edges of the riparian vegetation; or to the extent of seasonally saturated soil; or to the extent of unstable and potentially unstable areas; or to a distance equal to the height of one site-potential tree; or 150 feet slope distance; whichever is greatest.

Category 4 - Seasonally flowing or intermittent streams, wetlands, seeps, and springs less than one acre, and unstable or potentially unstable areas: This category applies to features with high variability in size and site-specific characteristics. At a minimum, the riparian management zones should include:

- The extent of unstable and potentially unstable areas including earthflows.
- The stream channel extending to the top of the inner gorge.

- The stream channel or wetland and the area from the edges of the stream channel or wetland to the outer edges of the riparian vegetation extending from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest. A site-potential tree height is the average maximum height of the tallest dominant trees for a given site class.
- Intermittent streams are defined as any non-permanent flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two physical criteria. Fish-bearing intermittent streams are distinguished from non-fish-bearing intermittent streams by the presence of any species of fish for any duration. Many intermittent streams may be used as spawning and rearing streams, refuge areas during flood events in larger rivers and streams, or travel routes for fish emigrating from lakes. In these instances, the guidelines for fish-bearing streams would apply to those sections of the full-extent of intermittent stream used by the fish from the mouth to the upper-most point of fish use.

Riparian management zones are not 'exclusion zones', but rather they are areas where potential vegetation management actions could only occur if needed to move the riparian area towards desired conditions (FW-DC-RMZ-01, 02). This would be accomplished by plan components that establish an inner zone and an outer zone within RMZs to refine vegetation management options and still meet RMZ desired conditions:

"FW-STD-RMZ-01. Vegetation management shall only occur, in riparian management zones from the edges of the active stream channel to within 150 feet within Riparian Management Zone Category 1 and to the edges of the active stream channel to 100 feet within Riparian Management Zone Category 2, 3, and 4, in order to restore or enhance aquatic and riparian-associated resources. Non-mechanical treatments, e.g., hand fuel treatments, prescribed fire, small diameter (e.g., sapling, pole) conifer thinning, may be authorized as long as aquatic and riparian-associated resources are maintained. Timber Harvest in this zone shall leave trees on site or use for aquatic restoration. Vegetation management may occur in the outer Riparian Management Zones to meet desired conditions for fuel loading and silvicultural desired conditions, so long as project activities retain functions of the outer Riparian Management Zone including sediment filtering, large wood recruitment to streams, and protection of the inner Riparian Management Zone from windthrow. Vegetation management in Riparian Management Zones shall not retard attainment of aquatic and riparian desired conditions."

Conservation Watershed Network

The conservation watershed network (CWN) plan components are intended to provide a pattern of protection across the landscape in which the habitat of listed fish and species of conservation concern receives special attention and treatment. Hydrologic unit code 12 (HUC12) watersheds in the CWN form a network of existing or historic population strongholds and habitats with high potential for productivity and fish abundance.

Management actions in HUC12 watersheds included in the conservation watershed network with instream and riparian conditions departed from desired conditions would be designed to support the recovery of listed species and critical habitat, and not retard progression towards desired conditions (FW-STD-CWN-01, 02). Under the revised plan, instream habitat conditions in conservation watershed network watersheds would be expected to continue improving under natural rates of recovery. Desired conditions and objectives would guide restoration efforts.

There are 245 HUC12 sub-watersheds within or directly adjacent to the Forests. Eighty-one of these watersheds were identified as CWNs because they met three or more of the inclusion criteria. A map of the CWN is shown in figure 2 and HUC12s included in the CWN are contained in Appendix C. Conservation Watershed Network Watersheds.

Criteria used to identify CWN watersheds (must meet at least three):

1. A major or minor spawning area for Snake River steelhead trout or Snake River spring and summer chinook salmon or both identified in the draft Snake River Recovery Plan (National Oceanic and Atmospheric Administration 2017).

2. Designated critical habitat for one or more Endangered Species Act listed fish species occurs in at least 25 percent of the stream (HUC12) network. Examples include the Columbia River bull trout, Snake River steelhead trout, Snake River fall Chinook Salmon.

3. Climate Shield (Isaak et al. 2015) modeled reaches that have a that have a year 2040 bull trout probability of occurrence greater than 25 percent.

4. A local bull trout population identified in the final Columbia River Bull Trout Recovery Plan (U.S. Department of the Interior 2015a).

5. Important spawning and rearing habitat for species of conservation concern.

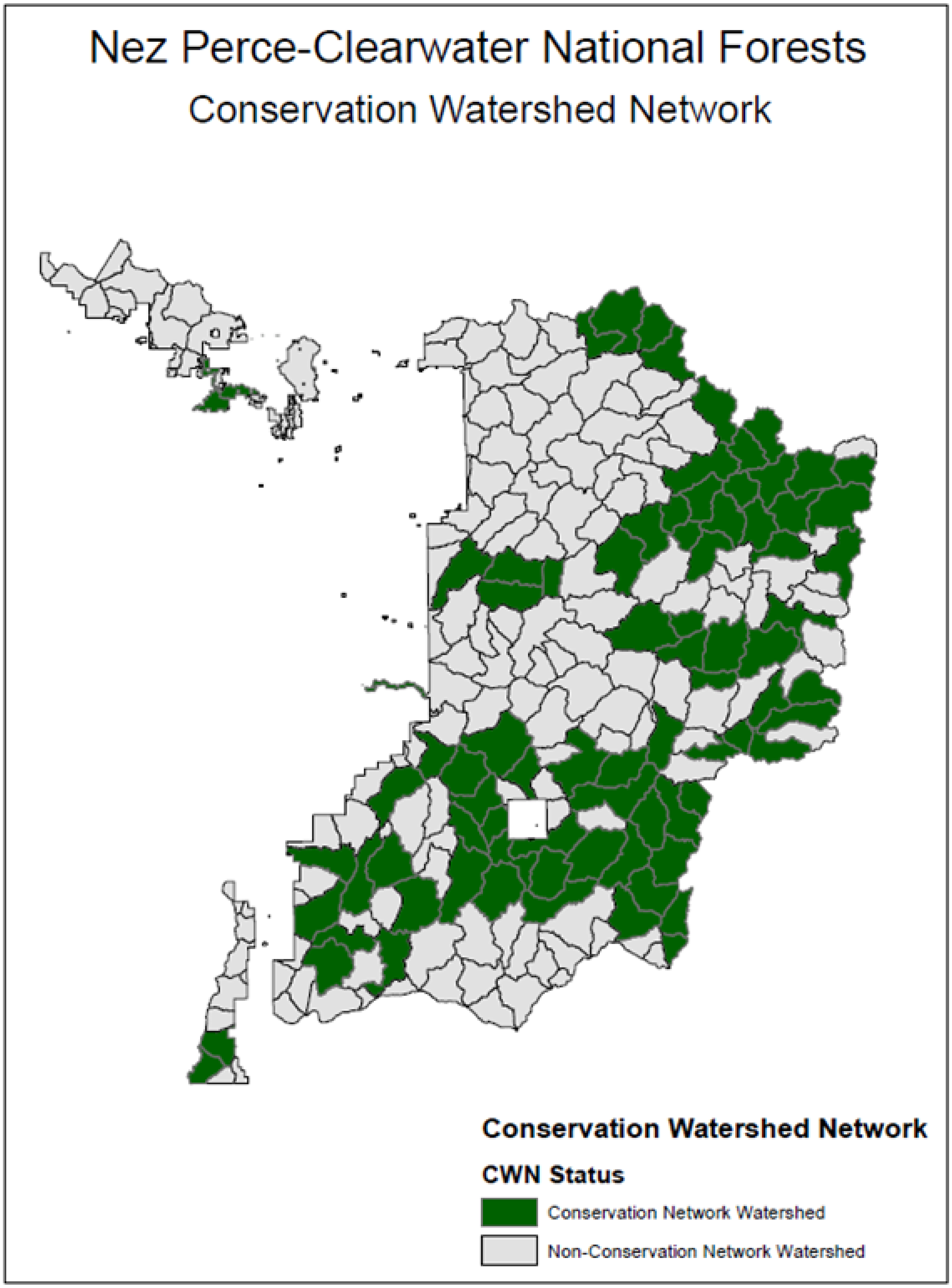

Figure 2. Watersheds included in the Conservation Watershed Network

Suitability of motorized and non-motorized access

Through the Recreation Opportunity Spectrum process fifty-five percent of the Nez Perce-Clearwater would be suitable for motorized use in the summer, and sixty percent suitable in the winter. These allocations are focused on providing opportunity for motorized users in designated areas across the Nez Perce-Clearwater. However, any new motorized routes or areas would require additional NEPA analysis, consultation, and a travel management decision. Where ecological or social reasons dictate, non-motorized opportunities were delineated as such. These areas include habitat for species such as grizzly bear and wolverine, cross country ski areas, and wintering habitat for some ungulate species.

Monitoring program

The monitoring section of the planning rule (36 CFR 219.12(a)(2)) sets out the requirements for monitoring in forest plans. The purpose of the monitoring program is to evaluate the revised forest plan's effectiveness towards achieving desired conditions and objectives (36 CFR 219.12(a)(2)). The program identifies monitoring questions, indicators, and data sources to meaningfully evaluate revised plan components. Results of this monitoring program are to be made available to the public biannually and include whether or not the results indicate a need to adapt any plan components or direction. Monitoring questions and associated indicators must be designed to inform the management of resources on the plan area, including by testing relevant assumptions, tracking relevant changes, and measuring management effectiveness and progress toward achieving or maintaining the plan's desired conditions or objectives.

Each plan monitoring program must contain the following (36 CFR 219.12(a)(5)(i-viii):

1) The status of select watershed conditions.

2) The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems.

3) The status of focal species to assess the ecological conditions required for the planning rule requirements for the diversity and abundance of wildlife.

4) The status of a select set of the ecological conditions required to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.

5) The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.

6) Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.

7) Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.

8) The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land.

The monitoring plan includes monitoring elements for federally listed species to meet planning rule requirements. These relevant monitoring elements for federally listed species are described under each species assessment throughout this BA. In addition to these federally listed species identified in the monitoring plan, the Planning Rule requires plans to identify focal species (36 CFR 219.12(a)(5)(iii)) to inform ecological conditions under the requirement for diversity of plant and animal communities (36

CFR 219.9). The Nez Perce-Clearwater identified the Western Pearlshell mussel, elk, and ponderosa pine xeric ecotone as focal species. The monitoring plan is in Appendix 3 of the revised forest plan.

The monitoring plan also includes a broad-scale monitoring strategy as developed by the regional forester to answer monitoring questions at a geographic scale broader than the action area of the revised forest plan (36 CFR 219.129(b)).

The PACFISH and INFISH Biological Opinion (PIBO) effectiveness monitoring program is the tool that would be used to meet this intent for aquatic and riparian resources. PIBO monitoring evaluates the status of stream habitat on Federal lands within portions of the Interior Columbia River and Missouri River basins and documents changes or trend of stream habitat conditions. Sites are visited every five years and sites on the Forests have been surveyed at least three times since PIBO sampling began in 1999. PIBO sampling or equivalent will continue within the plan area to provide feedback on stream condition in response to management activities at a larger geographic and temporal scale.

Potential Management Approaches

Plans may include optional content, such as potential management approaches. This optional content must not be labeled or worded in a way that suggests it is a plan component. Optional content in the plan could facilitate transparency and give the public and governmental entities a clear understanding of the plan and how outcomes would likely be delivered. Optional content in the plan may also describe partnership opportunities that support the achievement of desired conditions and objectives. If used, potential management approaches would describe the principal strategies and program priorities the Responsible Official intends to employ to carry out projects and activities developed under the plan, but they should not be interpreted as plan components. The potential management approaches can convey a sense of priority and focus among objectives and the likely management emphasis. Potential management approaches may discuss potential processes such as analysis, assessment, inventory, project planning, or monitoring. If potential management approaches are included as optional content in the plan, they may be used to inform future proposed and possible actions. The final directives for the 2012 Planning Rule caution to use care not to create unrealistic expectations regarding the delivery of programs. Forest plans may reference other sources of information in “other plan content” such as standard road and trail construction clauses, special use authorization clauses, memoranda of understanding between the Forest Service and other agencies, Congressional direction, or best management practice guidebooks. Optional plan content can be changed through administrative changes.

Other required plan content

In addition to requiring that a plan have components, the 2012 Planning Rule requires that a plan have “other required content” (36 CFR 219.7(f)(1)) addressing priority watersheds, the distinctive roles and contributions of the plan area, a plan monitoring program, and proposed and possible actions.

Existing Management and Summary of Proposed Changes

The direction in the 1987 forest plans and management is the existing guidance that is changing after the revised forest plan is finalized. The existing conditions currently on the ground are the outcomes of implementing the direction in the 1987 forest plans. The proposed action is the new direction presented in the revised forest plan. The effects of the proposed action are the outcomes of implementing the new direction under the proposed action. These effects are indirect effects because the plan does not directly affect conditions on the ground.

The next section, Summary of Proposed Action compared to the 1987 Forest Plans provides a detailed list of resource topics and how they differ from the 1987 forest plans and the proposed action.

Summary of Proposed Action compared to the 1987 Forest Plans

Table 4. Management Area allocation (acres) in the 1987 forest plans compared to the revised forest plan of the proposed action.

Management Area	1987 Forest Plans	Proposed Action
1(a)- Designated Wilderness	1,139,059	1,139,059
1(b)- Designated Wild and Scenic Rivers	57,891	57,891
1(c) National Historic Landmark	55,760	55,760
MA1 subtotal	1,231,638	1,231,638
2(a) Idaho Roadless Areas	1,481,636	1,481,636
2(b) Recommended Wilderness	197,695	258,210
2(c) Suitable Wild and Scenic Rivers	155,477	61,849
2(d) Gospel-Hump- MA2	30,164	28,498
2(e) Designated RNA	29,499	29,499
2(f) Proposed RNA	2,946	2,946
MA2 subtotal	1,489,736	1,467,078
MA3 subtotal	1,217,683	1,240,340
Forest Acreage including private inholdings	4,074,832	4,074,832

Table 5. Summary of notable changes between the 1987 forest plans and the revised forest plan by resource topic.

Resource Topic	1987 Forest Plans	Proposed Revised Plan
Recommended Wilderness	Elk Summit (3,453), Hoodoo (111,986), Lakes (3,500), Mallard-Larkins (66,377), Sneakfoot Meadows (9,465), Storm Creek (2,912)	Mallard Larkins (77,139 acres); Hoodoo (108,276 acres) and Meadow Creek (72,795 acres)
Non-conforming uses	No snowmobiling, no motorized travel, no mechanized, chainsaws ok	No non-conforming would likely preclude designated, administrative, and commercial uses allowed
Wild and Scenic Suitable Rivers	0 suitable, 29 Eligible: Bargamin Creek; Bear Creek Complex (Bear, Brushy Fork, Cub, Paradis, Wahoo); Cayuse Creek; Fish Creek; Hungery Creek; Johns Creek; Kelly Creek; Lake Creek; Little North Fork Clearwater River; Meadow Creek (Selway); Moose Creek Complex (East Fork Moose, Moose, North Fork Moose, West Fork Moose Creek, Rhoda); North Fork Clearwater River; Running Creek; Salmon River; Slate Creek; South Fork Clearwater River; Three Links Creek Complex (Three Links, West Fork Three Links); West Fork Gedney Creek; White Bird Creek; White Sand Creek (renamed Colt Killed Creek)	11 Suitable: Cayuse Creek, Fish Creek, Hungery Creek, Weitas Creek, Kelly Creek, North Fork Kelly Creek, Middle Fork Kelly Creek, South Fork Kelly Creek, Colt Killed Creek, Meadow Creek, Salmon River. 1 Eligible: Little North Fork
Access	Clearwater travel plan; site specific closure orders in some areas on the Nez Perce Forest (no travel plan in place)	More summer and winter motorized access. Important areas for non-motorized access in the future delineated.
Percentage of Forest in Motorized recreation opportunity spectrum Category	SUMMER: 45%	SUMMER: 55%
Percentage of Forest in Motorized recreation opportunity spectrum Category	WINTER: 39%	WINTER: 60%
Percentage of Forest in Non-Motorized recreation opportunity spectrum Category	SUMMER: 55%	SUMMER: 45%
Percentage of Forest in Non-Motorized recreation opportunity spectrum Category	WINTER: 61%	WINTER: 40%
Acres of Disturbance/Restoration Annually to be within Natural Range of Variability	40,000	53,000-64,500
Timber Harvest Acres annually	4,300	8,825-10,000
Timber Output Restoration potential timber sale quantity	50-60 mmbf	190-210 mmbf
Max Regen Unit Size	40 acres	207 acres

Management, geographic, and designated areas

Every forest plan must have management areas or geographic areas or both under the 2012 Planning Rule. The forest plan may identify designated or recommended designated areas as management areas or geographic areas (36 CFR 219.7(d)). These areas are assigned sets of plan components such as desired conditions, suitable uses, and in some areas either standards or guidelines or both. Geographic area desired conditions describe what we want to achieve in specific geographic areas that are not necessarily covered by forestwide desired conditions. Although all resources have been considered, the only desired conditions specified for a geographic area are those that are not adequately addressed by forestwide desired conditions.

Designated areas or features are identified and managed to maintain their unique special character or purpose. Some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch. Examples of statutorily designated areas are national heritage areas, national recreational areas, national scenic trails, inventoried roadless areas, wild and scenic rivers, wilderness areas, and wilderness study areas. Examples of administratively designated areas are experimental forests, research natural areas, scenic byways, botanical areas, and significant caves (36 CFR 219.19).

Management areas and geographic areas are spatially identified areas within the Nez Perce-Clearwater. These areas are assigned sets of plan components, such as desired conditions, suitable uses, and in some areas either standards or guidelines, or both.

Management Areas in 1987 Forest Plans

The 1987 Nez Perce Plan divided the Forest into 22 different management areas, each with their own set of plan components. Similarly, the 1987 Clearwater Forest plan had 17 Management areas. Part of the purpose and need of the Revised Forest Plan is to establish a consistent framework for the management of the combined forests. The Proposed Action would establish a consistent and simplified framework for the management of the Forests that are now administratively combined and uses three overarching management areas, under which nine subcategories are delineated. For comparison purposes the management areas from the 1987 forest plans have been combined in a way that best represents the management areas of the proposed action and the acres are compared in the BA introduction. The land allocation in the revised forest plan will change management areas and is part of the proposed action.

The revised forest plan will change the allocation of management areas and management area emphasis. It will also simplify management into three management areas, each with unique management emphasis. They are further subdivided into sub-management areas (Management, geographic, and designated areas). Under the proposed action, designated areas are managed under Management Area 1. These include designated wilderness, designated wild and scenic rivers, and the National Historic Landmark. Management Area 2 consists of Idaho Roadless Rule areas and proposed areas such as recommended wilderness, suitable wild and scenic rivers, designated and proposed Research Natural Areas, and the Gospel Hump area. Areas outside of designated and propose areas are managed for multiple uses and are called Management Area 3. These areas are commonly referred to as the managed front or front country. The managed front typically includes more roads, the majority of the campgrounds, more human use, and is managed for timber production.

Summer and Winter Recreation Opportunity Spectrum Settings in the 1987 Forest Plans

The existing Recreation Opportunity Spectrum settings under the 1987 forest plans include both winter and summer settings. These settings direct the condition and experiences recreationists would expect to experience within each setting. The existing condition classifications were based on the 1987 forest plans, as well as closure orders, the Clearwater travel plan, and other management decisions made since 1987 that have impacted the recreation opportunities across the Nez Perce-Clearwater. The amounts and percent of each setting are shown in Table 6 and Table 7. Recreation Opportunity Spectrum settings influence the suitability of motorized uses and influence the level of development of both the road systems and recreation facilities.

Table 6. Existing and proposed action summer recreation opportunity spectrum class distribution by acres and percent of the Nez Perce-Clearwater

Summer Recreation Opportunity Spectrum Class	Existing Acres	Existing Percent	Proposed Acres	Proposed Percent
Primitive	874,385	21.5	1,136,583	28.9
Semi-primitive non-motorized	1,379,864	33.9	637,115	16.2
Semi-primitive motorized	892,077	21.5	963,539	24.5
Roaded natural	923,303	22.7	1,069,725	27.2
Rural	5,202	0.1	125,850	3.2
Total	3,932,812	100	3,932,812	100

Table 7. Existing and proposed action winter recreation opportunity spectrum class distribution of the Nez Perce-Clearwater by acres and percent

Winter Recreation Opportunity Spectrum Class	Existing Acres	Existing Percent	Proposed Acres	Proposed Percent
Primitive	966,306	25.5	1,136,583	28.9
Semi-primitive non-motorized	1,436,737	36.5	429,357	10.9
Semi-primitive motorized	613,064	15.6	2,131,029	54.1
Roaded natural	920,130	23.4	236,343	6.0
Rural	2,819	0.1	2,819	0.1
Total	3,939,056	100	3,939,056	100

Activities Likely to Occur under the Land Management Plan

Vegetation Management and the Road Network

Analysis of historical fire regimes and mean fire return intervals across the forests were utilized to identify the amount of disturbance needed to restore fire regimes to function within their natural range of variability and are carried forward as objectives. Objectives target an approximate total area of disturbance (FW-OBJ-FIRE 1, FW-OBJ-TBR-02, FW-OBJ-TE-01). The increase in acreage for treatment in Table 8 is a direct result from identifying that fire as a disturbance process has not been allowed to play its natural role specifically in Fire Regimes I and III. The total acreage of vegetation treatments to meet these objectives would be achieved through timber harvest, non-commercial thinning, prescribed fire, and naturally ignited wildfires that are beneficial to restoring fire adapted landscapes. Prescribed fire would be applied to all regeneration harvest acres for fuels reduction and site preparation for planting or natural regeneration. Prescribed fire for ecosystem benefits would continue to be used. The relative contribution of each type of disturbance to that total will vary from year to year as wildfire conditions fluctuate through the life of the revised forest plan. It is very likely that ecosystem acres burned will increase from the numbers in Table 8, substantially in some years, as naturally ignited fires contribute acres. The result is that the total area burned from both broadcast and prescribed fire increases from 4,912 acres under the 1987 forest plans to 22,573 acres under the revised forest plan. Timber volumes will increase from an average of 55 MMBF currently to about 200 MMBF annually (FW-OBJ-TBR-02). Fuelwood harvested from the Forests averaged about 4.7 MMBF annually under the 1987 forest plans and would be expected to remain the same under the revised forest plan.

Under the 1987 forest plans, 26.1 percent of Forest acres are suitable for timber harvest. That would rise to 26.5 percent under the revised forest plan, or by approximately 14,000 acres. Acres available to harvest in MA2 would be the same under the revised forest plan as under the 1987 forest plans.

Table 8 summarizes annual timber harvest and prescribed fire in management areas 2 and 3 (acreages are from the Timber and Fire sections of the FEIS) that would be likely to occur. About 560 acres of regeneration harvest would be expected annually in MA2 under the revised forest plan. Over the next two decades under the revised forest plan, total regeneration harvest could increase from an average of 8,159 to 12,778 acres per year. Regeneration harvest units could be up to 40 acres in size, though exceptions could allow for regeneration harvest units up to 207 acres when determined necessary to help achieve desired ecological conditions (FW-STD-TBR-06). Regeneration harvest can be used to alter forest vegetation to simulate natural forest patterns and patch sizes, as well as improve forest resilience both in the short- and long-term. The acreage of Intermediate treatments in MA3, could increase by 1,495 acres to an average of 6,840 acres per year. Intermediate treatments can be commercial fuel reduction treatments; or harvest other than regeneration harvest that is designed to enhance growth, quality, vigor, and composition of the stand prior to a final harvest; or non-commercial fuels treatments aimed at reducing hazardous fuels such as hand thinning, or other mechanical fuels reduction.

Table 8. Average annual acres of timber harvest and prescribed fire likely under the revised forest plan

Annual Acres	Existing**	Likely	Difference (acres)	Percent Change (%)
MA2_Regeneration harvest	286	560	274	96
MA2_Intermediate harvest	0	0	0	0
MA2_Broadcast burning	286	7,914	7,628	2667
MA2_Prescribed fire (ecosystem restoration)	4,322	13,904	9,582	222
MA2_total	4,894	22,378	17,484	357
MA3_Regeneration harvest	7,893	12,918	5,025	64
MA3_Intermediate harvest	5,345	6,840	1,495	28
MA3_Broadcast burning	3,318	13,548	10,230	308
MA3_Prescribed fire (ecosystem restoration)	1,594	9,025	7,431	466
MA3_total	18,150	42,331	24,181	133
MA2 + MA3 total harvest	13,524	20,318	6,794	50
MA2 + MA3 total Rx fire*	9,520	44,391	34,871	366
MA2 + MA3 total	23,044	64,709	41,665	181

*Naturally ignited wildfire could contribute an un-estimate-able number of acres to burning for ecosystem benefits.

**Existing represents what the forest has done on average annually over the past 10 years; not what is allowed under the existing Forest Plans, which is substantially higher.

With the potential for increased timber harvest, the infrastructure section of the FEIS estimated that the number of log truck trips on Forest roads could increase from about 12,300 trips currently to about 40,000 trips annually. Currently, about 1,200 miles of Forest roads are maintained each year. The revised forest plan calls for 1,400 miles of road maintenance per year (FW-OBJ-INF-02). Gravel surface replacement is currently accomplished on the Nez Perce-Clearwater using timber harvest receipts and approximately 25 percent of forest road maintenance is performed by timber purchasers.

Currently, 7,682 miles of system Forest roads can access about 81 percent of harvestable acres in MA3. The 81 percent of acres in MA3 in this simple analysis are considered harvestable because they are within

1,600 feet (0.3 miles) of a roadway. While it is possible that future projects may propose to access a portion of the 19 percent of harvestable acres greater than 0.3 miles from a system road, it is not likely that a large percentage would be treated by harvest Reasons are many. Foremost among reasons are requirements in the revised forest plan, that while not identical to PACFISH/INFISH components, are similar and carry forward intent. Prior to PACFISH/INFISH, road building was more aggressive: roads could parallel streams, side-cast construction material into streams, place road segments on unstable or steep lands, alter streamflow characteristics and created crossings that may not allow aquatic organism passage. Prior to 1995 restrictions, roads accessed most of what is now called MA3 that could be reached. Plan components in the revised forest plan carry forward existing limitations that prevent aggressive road building. Another reason why some lands will not be treated is because they are unsuitable. Some of the acreage that is greater than 0.3 miles from a road will be either too steep, landslide prone, or not economical for treatment. These conditions will restrict adding new system roads and constrain building temporary roads in the unroaded MA3. Should some roading occur in future projects, it would most likely be temporary and obliterated prior to project completion.

While the spatial extent of the current open road network would be expected to be maintained to accommodate multiple use access (FW-GDL-ES-01), plan components are proposed to move the transportation system towards having 'minimal impact on aquatic and riparian conditions' (FW-DC-ARINF-01) and future road maintenance and new road construction 'shall be designed to minimize adverse effects to threatened, endangered, proposed, or candidate aquatic species and their habitat' (FW-STD-ARINF-01). Furthermore, when constructing or reconstructing roads in conservation watershed networks and HUC12 subwatersheds with Endangered Species Act critical habitat or listed aquatic species, projects shall result in a net decrease in the hydrologic connectivity of the road system and stream channel network…' (FW-STD-ARINF-07). Even with restoration and minimization actions, some short-term adverse effects are expected to occur when projects would be implemented.

Rangeland Management and Grazing

Active livestock grazing allotments comprise less than 15 percent of the Nez Perce-Clearwater National Forests administered lands. Of the approximately 4 million National Forest System acres within the Nez Perce-Clearwater, 34 permittees graze a total of 4,590 head of cattle on 612,766 acres within 36 active grazing allotments. In total there are 29,861 Animal Unit Months (AUMs) permitted for cattle on these active allotments, with a primary grazing season of June 1 through September 30. Animal Unit Months are the amount of forage required to sustain one cow/calf pair, one bull, or one steer for a standardized period of 30 animal-unit-days There are currently nine vacant allotments, totaling 217,172 acres. There is one permitted domestic sheep grazing allotment, but sheep grazing has not been authorized since 2009 due to potential conflicts between domestic sheep and native bighorn sheep. Generally speaking, active livestock grazing allotments are distributed along the western boundary and along the southern portions of the Forest. Grazing statistics for the Nez Perce-Clearwater are shown in Table 9.

Table 9. Livestock Grazing Statistics within the Planning Area for Nez Perce-Clearwater lands

Grazing Information	Nez Perce-Clearwater National Forest
Permitted Cattle Numbers[1]	4,590
Permitted Cattle AUMs (Active Allotments)	29,861
Grazing Permittees (Permit Entities)	34
Active Allotments	36
Active Allotment Acres on Nez Perce-Clearwater lands	612,766
Vacant Allotments	9
Vacant Allotment Acres on Nez Perce-Clearwater lands	647,296

[1]One cattle number is equal to 1 cow/calf pair or 1 steer or 1 bull; calves greater than 6 months old are counted as cattle.
Data Source: Forest Service INFRA database, 2020; Nez Perce-Clearwater geographical information system data

The proposed action does not make changes to allotment boundaries, active or vacant allotment status, or the amount or type of grazing that may be permitted in the future, however, the plan does provide guidance for future grazing authorizations, including standards and guidelines that must be adhered to in future planning (see revised forest plan, “Livestock Grazing” and “Livestock Grazing (aquatics and Riparian)). Note that vacant allotments could become active again in the future after a site specific analysis and ESA consultation.

Minerals and Mining

As directed by the Organic Administration Act of 1897 minerals are resources of the National Forests and are important to the nation’s welfare. In the Mining and Minerals Policy Act of 1970, Congress declared that, in the interest of the nation, it is the continuing policy of the federal government to foster and encourage private enterprise in the development of domestic mineral resources and the reclamation of mined land. This federal policy applies to National Forest System lands. The Forest Service recognizes the importance of mineral resources to the well-being of the nation and encourages bona fide mineral exploration and development. Mineral exploration and mining activity on the Nez Perce-Clearwater falls into three federally recognized legal and regulatory mineral categories – locatable, mineral materials, and leasable. Locatable minerals are those that may be “located” with a mining claim under the General Mining Law of 1872, as amended. There are four types of claims: lode, placer, mill site, and tunnel.

Salable minerals, or mineral materials include common variety mineral materials such as common varieties of sand, rock, stone, cinders, gravel, pumice, clay, most building stone, and other similar materials. Mineral materials, such as gravel, riprap, and crushed aggregate, for road maintenance, road construction, recreation sites, and trailheads has been and will continue to be in use on the Nez Perce-Clearwater. The mineral materials utilized are primarily derived from Forest Service pits and quarries located in the planning area. Current mineral material exploration and development on the Nez Perce-Clearwater is low and is expected to remain the same or slightly increase as in-service projects develop or as these nonrenewable resources are depleted. The disposal of these materials is discretionary. The Forest Service mineral material policy states that the disposal of mineral material will occur only when the authorized officer determines that the disposal is not detrimental to the public interest and that the benefits to be derived from the proposed disposal will exceed the total cost and impacts of resource disturbance.

According to the amended Mineral Leasing Act of 1920, leasable minerals include coal, phosphate, potassium, oil, oil shale, gas, and sodium resources that occur on public domain lands. Currently, there is no leasable mineral exploration or mining activity for coal, oil, or gas on the Nez Perce-Clearwater. Sources of nonrenewable energy are rated as having a very low mineral potential on the Nez Perce-Clearwater (National Energy Policy Development Group 2001).

The Nez Perce-Clearwater has a historic connection to mining. Discovery of placer gold occurred in the late 1850s, these deposits were mined extensively in the early 1860s. Small-scale and medium-scale sized placer and dredging operations mined and then reworked the deposits in many locations on lands contained within the Nez Perce-Clearwater through the 1940s. Lode discoveries were mined by moderately sized surface and underground operations during this same period. Generally, growth in locatable exploration and mining development remained flat after the 1940s because of the closure of gold mines by the War Production Board in 1942. Higher gold prices renewed interest and mining development on the Nez Perce-Clearwater in the 1980s and then again in the early 2000s. Today, small-scale placer and dredging operations continue to be the dominate type of mining on the Nez Perce-Clearwater.

Past activities have included, and future activities may include exploration for locatable minerals and underground or surface mining. In general, the geology of the Nez Perce-Clearwater possesses a low- to high-grade mineralization in many areas. Mineralized zones could include precious metals such as gold and silver; strategic rare earth element deposits; and base metal deposits, such as copper, lead, zinc, molybdenum, and manganese. Although many types of minerals could be mined on the Nez Perce-Clearwater, gold is the only mineral tied to a significant trend. However, copper, and other locatable deposits potentially exist in different locations on the Nez Perce-Clearwater and future development proposals are probable if the demand for these commodities continues to increase.

At present, the Nez Perce-Clearwater has approximately five approved Plans of Operations for small lode and placer mining and one approved exploration activity investigating larger deposits. Annually, the Nez Perce-Clearwater expects to administrate 40 to 50 plans of operation for suction dredging and receives 20 to 30 Notices of Intent. Notices of Intent generally propose small-scale mineral exploration activities that range from mineral prospecting with hand tools to small-scale placer operations. Currently, there are no large or medium sized mines operating on the Nez Perce-Clearwater. However, because of new technology in mineral exploration and mining techniques, mineral deposits once considered below grade could become in demand and the potential for mineral development would then increase. Many claims were patented under the General Mining Law of 1872, as amended, whereby they became privately owned land within the National Forest boundaries.

The proposed action determines the suitability of lands for minerals related activities, including for locatable, saleable, and leasable materials. Additionally, plan components identify the desired conditions as well as standards and guidelines to guide and constrain minerals activities in future planning efforts. Minerals related activities, like all other federal actions, requires compliance with the National Environmental Policy Act and with Section 7 of the Endangered Species Act. Thus, future proposals, plans of operations and notices of intent would be analyzed and consulted upon prior to being approved.

The Forest Service has limited discretion related to locatable minerals. While the revised forest plan places restrictions to reduce ecological impacts, where locatable minerals are available for prospecting or mining is largely a decision reserved for congress. This plan does not propose any mineral withdrawals, however, in areas that are recommended to Congress for special designation (recommended wilderness areas and suitable wild and scenic rivers), future mineral entry withdrawals may occur in the future. Specifically, designated wilderness areas generally prohibit new mineral entry. Similarly, Wild and Scenic Rivers with a wild classification are withdrawn from new entry. Existing valid rights are generally retained by the claimant. Plan components directing and restricting minerals operations can be found in the: Energy and Minerals, Energy and Minerals (Aquatic and Riparian), and Suitability sections of the revised forest plan.

Travel Management

The revised forest plan will not make any site-specific travel planning decisions. Instead, it will set the programmatic guidance under which future travel management decisions would be made. Thus, it will not have any direct effects on federally listed species. However, travel decisions will be made in the future under the direction of the revised forest plan after site-specific analysis and consultation. The existing condition related to the current travel system is described below.

The Forest Service classifies maintenance of National Forest System roads by five levels: 1, 2, 3, 4, and 5. Maintenance level 1 roads are closed to motor vehicle use. Maintenance level 2 roads are maintained for high-clearance vehicles. Maintenance level 3, 4, and 5 roads are maintained for passage by standard passenger cars during the normal season of use. The maintenance levels can influence how accessible they are to passenger vehicles and, indirectly, the speed at which vehicles can travel. In a sense, maintenance levels also indirectly influence how much use a route would be expected to receive because higher maintenance levels facilitate easier travel.

The Nez Perce-Clearwater overall has 7,680 miles of forest roads accessing approximately 1,331,040 acres, or 34 percent, of the Nez Perce-Clearwater, however 49 percent of roads are maintenance level 1 roads that are closed or in long-term storage, which means they are not currently open for motorized use. 2,003 miles, or 27 percent, are operationally maintenance level 2 roads and are suitable for high clearance vehicles; 1,572 miles, or 20 percent, are operationally maintenance level 3 roads and are suitable for passenger cars; 194 miles, or 3 percent, are operationally maintenance level 4 roads and are typically two lane gravel roads suitable for passenger cars; and 113 miles, or 2 percent, are operationally maintenance level 5 roads and are typically paved and suitable for passenger cars traveling at higher speeds.

Routine road maintenance work, such as brushing, blading, and ditch and culvert cleaning, is periodically performed on approximately 3,900 miles of maintenance level 2, 3, 4, and 5 roads as funding allows and, in most cases, they are kept in a drivable condition for their designed use. Annually, approximately 1200 miles of road are maintained by force account, partners, and timber sales. The approximately 3,800 miles in maintenance level 1, which includes roads treated for intermittent stored service, do not receive routine maintenance work but may be maintained for resource protection.

Decommissioned roads are roads that were closed permanently. Decommissioning may include recontouring, removal of the road prism, placing barriers, or other measures that ensure their closure. In some cases, decommissioned roads don’t even receive foot traffic. After closure, these routes regrow vegetation effectively preventing their use. Figure 3 shows the condition of a decommissioned road as an example. In this case, the road was effectively closed, and rehabilitated and there was no evidence that the area even received foot traffic.

Figure 3. A decommissioned road near Fish Creek. The road prism was removed, an earthen barrier was established, trees have grown where the road previously was, and it is not passable by any motorized vehicle. There was no evidence of motorized use, nor was there evidence of foot use.

Maintenance level 1 roads have been placed in storage for at least one year between intermittent uses. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Maintenance level 1 roads are not designated for motor vehicles as a road and are not shown as a road on the motor vehicle use map. They may be managed and designated as a motorized trail and shown on motor vehicle use maps as a motorized trail, or they may be available and suitable for non-motorized uses. Road entrances will be physically blocked or disguised, and culverts may be removed. Route markers should be installed but need not be visible from an open road at the entrance. Roads managed at this maintenance level are described as being in basic custodial care, which may include condition survey and mitigation measures for potential resource damage.

On the Nez Perce-Clearwater, maintenance level 1 roads may be taken out of storage for administrative use, at which time they are no longer maintenance level 1. Thus, they are sometimes referred to as administrative roads. These roads remain closed to public use but may be used by the Nez Perce-Clearwater and other authorized individuals during emergencies and to access the forest to conduct forest protection and management activities. Use by forest service staff or others requires explicit permission from line officers like district rangers or the forest supervisor. The travelability of these roads vary depending upon the initial condition of the road at the time of storage, the length of time the road has been in maintenance level 1, and how recently the road had received maintenance like clearing downed trees. The Nez Perce-Clearwater recognizes the travel Routes Data dictionary (U.S. Department of Agriculture 2009) definition “roads receiving level 1 maintenance may be of any type, class, or construction standard, and may be managed at any other maintenance level during times when open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic, but may be available and suitable for non-motorized uses (U.S. Department of Agriculture 2012a)".

While maintenance level 1 roads are close, some unauthorized uses by the public can occur depending on the condition of the road and the effectiveness of the closure measures. In many cases, maintenance level 1 roads don't receive any motorized uses. Often, level 1 roads become brushed in and not useable without considerable effort to remove brush, barriers, or other impediments. In other cases, they may receive some unauthorized use when gates are damaged, or closure measures are circumvented. The Forest frequently examines gates and other closure devices, repairs damage, place additional barriers, and replaces broken locks. Even when there are attempts to circumvent gates or barriers, many of these routes become less passable over time because they brush in, typically within 5 years, and tree fall blocks passage. There is a continuous effort to ensure that gates and barriers remain in place or effective. A cursory search in the Forest Service's Infra database and examination of some contracts documented that the Nez Perce Clearwater replaced or repaired 40 gates in the last five years. Additionally, every timber contract includes requirements to replace, repair or install gates or closures or and these efforts are not included in this estimate. The estimate also does not include instances of lock replacement that are not reported in Infra or common actions like the placement of boulders to prevent use. Keep in mind many gates, especially those in the backcountry remain intact and effectively closed. Those more likely to be illegally breeched or used are those with higher levels of human use, for example those in Management Area 3 closer to population centers.

Figure 4 shows a maintenance level 1 road that was placed into storage rather than decommissioned to manage timber resources in the distant future. While the gate was damaged, use was minimal because brush and trees had become established within the road prism which limited travel by motorized vehicles. Furthermore, downed trees had blocked use a short distance up this road.

Figure 4. A road placed in maintenance level 1 storage near Fish Creek. While the gate had been damaged by vandalism, the road prism had considerable vegetation growth. There was evidence of limited foot traffic, but no evidence of OHV or full-sized vehicle use.

Maintenance level 2 includes roads that are open for use by high-clearance vehicles. Passenger car traffic, user comfort, and user convenience are not taken into consideration. Traffic normally is minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Maintenance level 2 roads are maintained for use by high-clearance vehicles and log-haul but are not generally suitable for passenger cars. Surface smoothness is not considered a priority and these roads may not be passable during periods of inclement weather. They have low traffic volume and low speed. Typically, they are local roads that connect to collectors and other local roads. They have water bars, drain dips, or cross drains as the preferred drainage treatments and the use of culverts, arches, and bridges is avoided when possible. On the Nez Perce-Clearwater, these roads may be maintained at a higher level or reconstructed during forest management activities for a specified period of time for administrative and contractual use.

Maintenance level 3 includes roads that are open and maintained for travel by a prudent driver in a standard passenger car during the normal season of use. User comfort and convenience are not considered priorities. Warning signs and traffic control devices are provided to alert motorists of situations that may violate expectations. Maintenance level 3 roads are passable to prudent drivers in passenger cars during the normal season of use. They are typically single lane with turnouts visible from either direction or usually must be driven at low speeds. They may be local or collector roads and have low-to-moderate traffic volume. These roads typically connect to arterial and collector roads or other maintenance level 3 roads. They may include some dispersed recreation sites. Drainage is provided via a combination of drivable dips, culverts, arches, and bridges and these roads may have potholes or washboarding.

Maintenance level 4 includes roads that provide a moderate degree of user comfort and convenience at moderate travel speeds for prudent drivers in a standard passenger car during the normal season of use. Most roads are double lane and aggregate surfaced; however, some roads may be single lane with turnouts visible from either direction and some may be paved. Roads in this maintenance level have moderate traffic volume and speeds. They usually are collectors and arterials and may connect to state and county roads and include some developed recreation areas. Drainage is provided primarily via culverts, arches, and bridges.

Maintenance level 5 includes roads that provide a high degree of user comfort and convenience for prudent drivers in a standard passenger car during the normal season of use. These roads are normally double lane, paved facilities, although some may be aggregate surfaced sections and may be dust abated. These roads have a smooth road surface, are often paved or chip-sealed with lane striping and have defined shoulders. Maintenance level 5 roads inspire confidence in the traveler that hazards will be few and identified well in advance and the roadway is visually pleasing. They have high traffic volume and speeds and typically connect to state and county roads. These roads are usually an arterial or collector and they may include some developed recreation roads. Drainage is provided via culverts, arches, and bridges.

An inventory of the motorized routes is maintained by the Forest Service and information used to conduct the analysis largely comes from the Infra module of the U.S. Forest Service's Natural Resource Manager Database. This database is a collection of web-based data entry forms, reporting tools, and geographic information system mapping tools that enables the Nez Perce-Clearwater to manage and report accurate information about constructed features and land units. Activities implemented by other entities that administer sections of roads within the National Forest System are not included in this database, except for cost-share roads. The Infra database often undergoes updates, data entry, and maintenance. While this data is the best available to understand the travel system, there can be spatial misalignments, changes on the ground that have not yet been updated, missing information, and cases where users create new features that are not system routes. User created routes are closed when discovered and are less common on the Nez Perce Clearwater than other National Forests because of its highly productive forest growth.

Roads are distributed unevenly across the plan area. Specifically, Management Area 3 is managed for multiple uses and has more roads than other Management Areas (figure 44 and figure 45). The spatial extent of the current road network would be expected to at least be maintained due to guideline FW-GDL-ES-01. Per the Infrastructure section of the FEIS, given the current extent of the road network, "new road construction is likely to be limited" and "temporary road construction would be used more commonly to meet short-term access needs."

On November 9, 2005, the Forest Service published the final rule "Travel Management: Designated Routes and Areas for Motor Vehicle Use" in the Federal Register. The 2005 Travel Management Rule requires National Forests to develop a minimum road system to accommodate resource needs. In 2015, a forest-level roads analysis was completed for the Nez Perce-Clearwater. This analysis established a minimum road system for arterial, collector, and important local class National Forest roads on the Nez Perce-Clearwater. This broad-scale analysis encompassed all existing National Forest System roads on the Nez Perce-Clearwater. The report provided an assessment of the road infrastructure and a set of findings and recommendations for revisions to the Nez Perce-Clearwater transportation system. The report provided information to Nez Perce-Clearwater managers regarding the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands.

The Nez Perce-Clearwater Travel analysis assessed 7,563 miles of national forest system roads delineated in the INFRA database. Based on this analysis, 7,549 miles were identified as "likely needed for future use" and could become the proposed action in identifying the Minimum Road System as defined in 36 CFR 212.5(b). Approximately 14 miles, less than one percent of the road system, were identified as "not likely needed for future use" and may be considered candidates for conversion to another use, storage for future use, of removal through decommissioning. The report did note that site specific roads analysis and project level assessment could result in substantially more miles identified as unneeded and/or high risk. Other roads that were rated as "high risk" were identified as candidates for storage for future use, reconstruction or relocation of the road, or additional road maintenance.

The Clearwater Travel Plan established a system of designated routes for summer motorized uses. Off-route travel by motorized vehicles were prohibited, except for snow machines in winter. The Clearwater travel plan is in effect now and will continue to be in effect after the Revised Forest plan is completed. The Clearwater travel plan applied only to the Clearwater National Forest. It designated a site-specific transportation system and prohibited indiscriminate cross-country traffic. Prior to the Clearwater Travel Plan, all areas of the forest were open to motorized and mechanized uses except where routes or areas had been closed through a site-specific analysis or in wilderness. In other words, all areas of the forest were open to these uses unless designated closed. The regulatory structure of "open unless specifically closed" led to the establishment of motorized uses in many areas of the forest where it was not specifically prohibited. The Clearwater travel plan established that motorized uses are only allowed on designated routes and are otherwise closed unless designated open in a travel management decision. The Clearwater travel plan also made decisions on where winter motorized uses are allowed. Travel planning on the Clearwater National Forest would continue to be revised under the Revised Forest Plan on a site-specific basis as needed. The U.S. Fish and Wildlife Service and Forest consulted on the effects of the Clearwater Travel Plan in 2011 (USFWS ID: 14420-2011-F-0066). Implementation of the Clearwater Travel Plan will continue as planned under the revised forest plan but may undergo revision or updates.

The Clearwater Travel Plan designated both the summer and winter motorized over snow travel conditions on only the Clearwater National Forest portion of the planning area. The Clearwater Travel Plan prohibited motorized over snow travel within recommended wilderness where it was previously allowed. Motorize over snow travel outside of recommended wilderness remained open in rest of the Clearwater National Forest (U.S. Department of Agriculture 2017).

The four groomed snowmobile trail systems on the Nez Perce Clearwater include Fish Creek Recreation Area, Lolo Pass/Powell, Elk City/Dixie Area, and Elk River Snowmobile Trail system. Grooming is accomplished in partnership with Idaho Parks and Recreation, Montana Fish Wildlife and Parks, Timberliners, and Missoula Snowgoers and Snodrifters Snowmobile clubs. Eight outfitted operations provide snowmobile trips for visitors.

The Nez Perce National Forest has not completed a travel plan, so the Nez Perce National Forest is open to motorized travel unless closed by a site-specific decision. Travel planning will occur on the Nez Perce National Forest portion of the planning area under the direction of the revised forest plan and may also include modifications of the travel plan system on the Clearwater National Forest. Travel plans make decisions on the whole breadth of travel system within the national forest lands in one project. They establish the travel system as closed unless designated open instead of open unless closed as is the current condition on the Nez Perce National Forest. The goal is to establish a transportation system that is environmentally and financially sustainable while meeting public needs. Travel plans identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of NFS lands. During Travel Plan development, the minimum required travel system is identified though an assessment of the travel system, and then travel system routes are determined in a forest wide decision. The evaluation includes both system and non-system routes (user created) with each one evaluated on a route-by-route basis and a determination is made as to whether each route will become National Forest System Routes or be closed as a non-system route. Included in that decision is whether routes are open to the public, whether they are open only for administrative uses but closed to the public or closed. It may also determine whether closed routes would be decommissioned without restoration, in storage, or restored complete with recontouring and revegetating.

Travel plans often include the identification and authorizations of new routes, the maintenance level of each route, season of use and the appropriate uses of each route. Routes are determined to be opened year-round, or seasonally, including in which season they are opened. Seasonality decisions are often made in an effort to protect the road but may also be determined to be closed seasonally to protect resources like game species.

During travel planning, the types of travel or vehicles allowed are determined for each route and may include full sized vehicles, jeep trails, Off-highway vehicles of various width, or in some cases motorcycle only trails. The goal is to provide a variety of recreational experiences to users, consistent with the Recreational Opportunity Spectrum Setting where the route is located. Routes can be determined to be more appropriate as foot trails, motorized trails, or roads.

Travel planning also includes the determination of which areas are designated open to winter over snow travel. Winter travel plans include the identification of designated winter motorized routes. Winter travel planning differs from summer in that over snow vehicles uses are often not limited only to the designated routes, but instead broad areas are identified for over snow use are identified in a map. Thereafter, winter motorized users can travel anywhere with the areas mapped as open to winter travel.

The Travel Planning Rule applies to winter over-snow motorized travel as well. Travel plans often include decisions on whether and which areas are opened to winter motorized recreation. These include decisions on which winter motorized trails would be opened, access points for winter recreation, and areas that would be open for winter motorized recreation. Often all areas suitable for motorized uses are opened to winter motorized recreation unless resource concerns prompt closure, or when resolving conflict between motorized users and non-motorized winter recreation.

In addition to forestwide travel plans, travel decisions can also be made in any projects that opens or closes travel system routes. For example, a recreation project could establish a new foot or motorized trail, relocate an existing travel route, or close a travel route. Another common example is that a timber project could include the improvement of an existing route, the construction of new permanent road, and a decision as to whether that new road would be open or not to public use. Timber projects often include temporary roads. Temporary roads do not become system routes once the projects are over and are obliterated.

While the plan will not make any site-specific travel management decisions on the ground, the Forest Plan will provide the programmatic framework under which future travel management decisions will be made. The Travel Plans and any travel decisions in individual projects would be required to be consistent with the Forest Plan direction including all desired conditions, guidelines, and suitability of uses plan components. The forest plan identifies where different types of motorized uses (for both over snow and summer use) are suitable or unsuitable via Recreation Opportunity Spectrum Settings, and suitability of uses within different management area allocations such as Designated Wilderness, Recommended wilderness, Idaho Roadless Rule Areas, Designated Wild and Scenic Rivers, Suitable Wild and Scenic Rivers, The National Historic Landmark, proposed and existing Research Natural Areas, Riparian Management Zones and more. In addition, Forest Plan desired conditions, standards, guidelines also provide direction for which project level travel management decisions would need to be consistent. Areas identified as suitable for motorized uses set the broad areas where motorized uses are or are not suitable and suitable areas are where future routes could occur. However, an individual travel decision or a forest wide travel plan would be required to authorize or establish such uses or routes. Under this revised plan, it is anticipated that the Nez Perce portion of the Forest would have a travel planning process completed for both summer and winter use, based on the suitability and land allocation decisions made in the revised plan.

In addition to planning for roads, travel management also would determine which trails would be open to motorized use or designated as non-motorized. While construction of new trails is not prohibited by the plan in most areas, it is unlikely that new trails would be constructed except in very specific situations for short segments. Relocation of trails to mitigate other resource concerns is likely to occur. Changing the classification of a trail opening or closing it to motorized use or changing the types of vehicles (generally by specifying allowable widths) on motorized trails could all occur in a travel planning process. Plan components provide sideboards for changing trails from motorized to non-motorized and place restrictions on where non-motorized trails could be changed to a motorized trail. Presumably changes in trail designations would be infrequent and based on site specific conditions and user interest. Effects analyses done in the Final Environmental Impact Statement were conducted with the assumption that additional loop opportunities would be made available for motorized users over the life of the plan, but that these additional opportunities would be limited to less than a half dozen trail designation changes, primarily on the North Fork Ranger District. Travel planning decisions would be subject to a public process, environmental review, and ESA section 7 consultation prior to decisions being made.

Helpful context for effects of the plan is what has occurred while following the 1987 plan guidance. As shown in the table 10 and table 11. below, many miles of roads have been decommissioned in both the Nez Perce and Clearwater National Forests. The total number of roads on the Nez Perce-Clearwater has been steadily decreasing since 1999. A total of about 1,625 miles of National Forest System roads and non-National Forest System roads have been decommissioned during this time. Most of this decommissioning took place on the non-system roads that were legacy roads from former timber harvest practices, which are no longer needed for new harvest techniques, and roads in unstable terrain or with failing drainage structures.

However, there have been additions to National Forest System roads during this time as well. These additions include the construction of approximately 46 miles of new roads for vegetation, special uses, recreation management, and watershed improvements by moving roads away from sensitive stream habitats. The majority of the increases are due to the need for better located roads that provide for a more stable, less impacting road system. It is reasonable to assume that there will be both decommissioning of existing roads and new roads created, but where, when, and how many is not known. Decisions on decommissioning or new roads are determined at the project level after site specific analysis. Future trends in road decommissioning would be determined in either a travel plan, for example on the Nez Perce National Forest, or through discrete travel decisions for specific projects as time goes on. Past trends are not necessarily an indicator of future travel decision trends, and these trends were the result of the direction in the 1987 forest plans. Travel decision trends were established by a collection of forest wide and individual travel decisions that occurred over time. In all cases, these projects will undergo NEPA and applicable Endangered Species Act consultation.

Table 10. Miles of roads decommissioned from 1999 to 2018 on the Clearwater National Forest

Year	Miles	Year	Miles
1999	127.8	2009	127.0
2000	67.3	2010	138.3
2001	92.0	2011	90.1
2002	42.7	2012	154.9
2003	41.9	2013	194.4
2004	16.9	2014	97.4
2005	29.6	2015	60.5
2006	55.0	2016	65
2007	52.1	2017	30
2008	114.4	2018	46

Table 11. Miles of roads constructed from 1999 to 2018 on the Nez Perce National Forest

Year	Miles	Year	Miles
1999	13.52	2009	1.58
2000	2.33	2010	1.13
2001	.65	2011	0
2002	.05	2012	4
2003	.45	2013	6.6
2004	.38	2014	9.88
2005	0	2015	.13
2006	2.08	2016	2.4
2007	0	2017	.1
2008	0	2018	0

Fire Management

Fire is a necessary and critical ecological function across the Nez Perce-Clearwater that plays a central role in providing quality habitat for both plant and wildlife species. Wildland fire refers to both wildfire (unplanned ignitions) and prescribed fire (planned ignitions). Wildland fire management includes all activities for the management of wildland fires to meet land management objectives. Fire management includes the entire scope of activities from planning, prevention, fuels or vegetation modification, prescribed fire, hazard mitigation, fire response, rehabilitation, monitoring, and evaluation. The management of wildland fire influences whether fire effects have beneficial or non-beneficial impacts on resources such as air and water quality, wildlife habitat, recreation areas, and communities. Wildland fire management incorporates a spectrum of responses ranging from full suppression to managing for resource objectives. Suppression is a management strategy used to extinguish or confine all or a portion of a wildfire. Fuels management is the practice of controlling flammability and reducing resistance to controlling wildland fuels through mechanical, chemical, biological, or manual means, or by fire in support of land management objectives. Fuels treatments result in a change in the amount, configuration, and spacing of live and dead vegetation, creating conditions that result in more manageable fire behavior and reduced intensity during future wildland fire events. The existing and desired average acres burned per decade from 1984 to 2017 by fire regime and severity are shown in table 12.

Historically, large fires have occurred across the Nez Perce-Clearwater, geographic information system (GIS) fire history database records, recent data (1940 to present), and anecdotal evidence (pre-1940). The only fire regimes at or above average in terms of expected burn acreage are Fire Regimes IV and V on the Nez Perce-Clearwater. These regimes represent 32.8 percent and 0.8 percent of the forest, respectively. The activity in the long fire return interval replacement severity Fire Regimes IV and V was mainly driven by large fires in 2012, 2015, and 2017. This was due to drought and extremely dry fuels at higher elevations.

Fire has been reduced from playing its natural role especially within Fire Regimes I, II, and III. These fire regimes comprise 9.3, 0.44, and 53.8 percent, respectively, of the Forest. The absence of fire in these regimes is likely derived from the combination of cooler climatic conditions in the 1900's; reduced fuels from large fires in the early 1900's; the increasing capability of fire suppression technology, such as air tankers and aerially delivered firefighters; and the agency's focus on suppression.

Table 12. Existing and desired conditions for average amount and severity of wildland fire per decade by fire regime group

Fire Regime Group[1]	Average Desired Acres Burned per Decade[2]	Existing Average Acres Burned per Decade[3]	Desired Fire Return Interval (Frequency)[1]	Desired Fire Severity[1,4]	Existing Low Severity Acres per Decade[5]	Existing Moderate Severity Acres per Decade[5]	Existing High Severity Acres per Decade[5]
I	173,000 to 218,000	38,540	0–35 years	Low/mixed	23,273	10,344	4,924
II	9,000 to 11,000	2,540	0–35 years	High	2,242	272	28
III	286,000 to 325,000	81,900	35–200 years	Mixed/low	42,329	23,701	15,874
IV	70,000 to 91,000	100,000	35–200 years	High	29,769	32,547	37,705
V	600 to 1,100	2,440	200+ years	High/mixed/low	1,516	666	254
Total	538,600 to 646,100	225,420	not applicable	not applicable	99,129	67,530	58,785

Desired condition applies to all potential vegetation types.

[1]Fire regime groups, fire return intervals, and fire severity types, as defined in the Fire Regime Condition Class Guidebook (U.S. Department of Agriculture 2010)

[2]Expected acres are the average range derived from Mean Fire Return Interval data from LANDFIRE 2012, v.1.3.0. Rounded to nearest hundred where applicable.

[3]Existing comes from 1984 to 2017 Monitoring Trends in Burn Severity data, wildfires greater than 1,000 acres. Does not include unburned areas within wildfire perimeters.

[4]First adjective indicates dominant severity. Mixed severity is defined as a combination of low to high fire severity within the perimeter of a single fire or across consecutive events.

[5]Fire severity classification is defined by Monitoring Trends in Burn Severity. Existing fire severity comes from 1984 to 2017 Monitoring Trends in Burn Severity data.

Fire data in the Nez Perce-Clearwater's GIS database shows wildfire areas burned since 1870. In this dataset, the earliest records may not be complete and often include only large fires or active fire years, creating the potential to underestimate the quantity and extent of older fires. The data is based on fire start records on National Forest lands and does not include ignitions that went out prior to being detected. This cycle has many influences, including fuels, weather (daily, monthly, and long term), ignition sources, and suppression efforts. On average, 314,608 acres of large fires burned per decade from 1870 to 2017. Drought years and ineffective fire suppression from 1870 to 1899 burned approximately 398,601 acres. From 1900 to 1939, fires burned approximately 2,347,828 acres. From 1940 to 1989, fires burned approximately 366,143 acres. From 1990 to present, fires have burned approximately 1,606,552 acres.

The tools the Nez Perce-Clearwater has used to move towards desired conditions include hazardous fuel reduction by mechanical treatments, such as timber harvest and hand thinning; prescribed burning; and managing natural wildfire ignitions for land management plan resource objectives. Most of the mechanical fuels reduction and prescribed fire activities over the past ten years on the Nez Perce-Clearwater have been implemented as timber sales and reduce activity generated fuels resulting from harvest. Prescribed burning treatments have been undertaken to improve wildlife habitat in the forested and non-forested landscape where the forest plans have allowed those activities.

Timber harvest and associated slash disposal treatments such as pile burning, or broadcast burning has averaged 4,345 acres per year for the past ten years across the Nez Perce-Clearwater and is expected to increase in pace and scale in the future. Hand thinning and other non-commercial mechanical treatments have accounted for approximately 2,510 acres per year over the past ten years. Wildland fire, including management ignited prescribed burning and wildfires managed for resource objectives, has accounted for the majority of fuels treatment over the last ten years, with an annual average of 4,346 prescribed burning acres and 35,700 wildfire acres. The amount of fuels treatments and prescribed burning have not been enough to have had a significant effect in fostering fire resilient landscapes or reduce wildfire risk to communities.

The type of fire management activities are not expected to change over the life of this revised plan. It is an overarching strategy of the plan to increase the use of wildland fire during this planning cycle to move towards desired conditions. This will likely manifest as an increase in the amount of prescribed fire as well as an increase in the acres burned from unplanned ignitions that are characteristic for that fire regime. Put another way, a transition from large fires outside of what is normal for that fire regime would be replaced by more frequent (and cumulatively larger acres) of fire burning at lesser severities that is within the fire regime (and better aligned with the natural range of variation) would occur. Fuels activities would support and augment this goal, particularly in areas where fuels are greatly departed from the natural range of variation or where other values at risk (e.g., communities and WUI) preclude or limit the use of fire.

Recreation Management

The focus of forest recreation management is to provide a range of environmentally sustainable opportunities to participate in a variety of recreational activities in forest settings in order to meet the needs and desires of visitors. Recreation settings are the social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities.

The Forest Service often categorizes recreational activities into two descriptions – developed recreation and dispersed recreation. Both types of recreation are categorized further by the recreation opportunity spectrum. The recreation opportunity spectrum includes a non-motorized and motorized access opportunities discussion, in addition to developed and dispersed opportunities. In some cases, these recreation opportunities are enhanced through the services offered by those in possession of a recreation special use permit for outfitting and guiding services or a recreation event.

Developed recreation occurs in settings that have been created or constructed for specific recreational purposes on the national forest, such as overnight campgrounds, picnic sites, rental cabins, visitor centers, interpretive trails with display panels, organizational camps, and special use permitted recreation residence tracts. Fees may or may not be charged. These locations are usually given site names, inventoried, and categorized in Nez Perce-Clearwater databases with basic capacity information and design features.

Dispersed recreation occurs across the forest where there is little or no infrastructure or facilities except roads and trails. Activities include hiking, bird watching, driving for pleasure, rock and ice climbing, boating, hunting, fishing, horseback riding, berry picking, backcountry skiing, snowmobiling, camping, and motorized and mechanized trail use. Dispersed camping occurs in the general forest area that has little, or no Forest Service facilities provided, often where there is repeated dispersed use. Recreation special use permits are issued to private businesses, individuals, institutions, other government entities, and nonprofit groups to provide for occupancy and use of the national forests beyond what is normally available to the public. Table 13 shows the estimated visitor use by visit type based on National Visitor Use Monitoring data for the three most recent survey years for the Forests. Table 14 shows the major categories of activities visitors to the Forests participated in from the last visitor use survey. Table 15 lists the number of developed recreation sites by classification and table 16 shows the dispersed recreation sites by category down to the district level. Table 17 shows the current recreation special use permit types by District.

Table 13. Estimated site visits for the plan area in 2006, 2011, and 2016

Visit Type	2006	2011	2016
Day Use Developed Site Visits	195,000	155,000	205,000
Overnight Use Developed Site Visits	81,000	69,000	74,000
General Forest Area Visits	385,000	235,000	409,000
Designated Wilderness Visits	30,000	21,000	76,000
Total Estimated Site Visits[1]	689,000	481,000	763,000
Total Estimated National Forest Visits[1]	440,000	294,000	550,000

1. Note that a site visit is different than a forest visit since a single visitor may visit multiple site types within a single forest visit. NVUM surveys are conducted every five years, so numbers apply only to the respective year, not to a five-year interval. Data Source: National Visitor Use Monitoring Reports for 2006 and 2011 for the Nez Perce and Clearwater National Forests separately and for 2016 a combined Nez Perce-Clearwater Report.

Table 14. Activity Participation on the Nez Perce National Forest as surveyed in 2016

Activity	Percent Participation[1]	Percent Main Activity[2]	Average Hours Doing Main Activity
Hiking/Walking	44.5	9.8	5.8
Viewing Natural Features	43.4	16.9	4.6

Activity	Percent Participation[1]	Percent Main Activity[2]	Average Hours Doing Main Activity
Relaxing	37.9	7.0	27.3
Driving for Pleasure	35.6	7.3	3.2
Viewing Wildlife	29.8	1.7	4.7
Developed Camping	17.6	4.2	32.5
Hunting	13.4	11.6	18.6
Fishing	12.5	5.3	11.0
Nature Center Activities	11.6	2.1	2.4
Visiting Historic Sites	10.0	0.6	4.1
Picnicking	9.0	0.7	17.0
Cross-country Skiing	7.3	6.8	2.0
Motorized Trail Activity	7.2	1.6	8.1
Primitive Camping	7.0	1.1	55.1
Nature Study	6.3	0.2	3.6
Gathering Forest Products	6.2	1.1	3.8
OHV Use	5.2	1.0	19.0
Motorized Water Activities	3.9	2.5	13.6
Other Non-motorized	3.6	0.8	2.3
Non-motorized Water	3.4	2.0	14.2
Bicycling	2.9	0.4	9.1
Backpacking	2.7	0.8	33.3
Snowmobiling	2.6	2.6	4.8
Resort Use	2.2	0.1	25.6
Some Other Activity	1.8	1.0	3.8
No Activity Reported	1.4	15.7	0.0
Other Motorized Activity	0.5	0.2	0.0
Horseback Riding	0.5	0.1	10.5
Downhill Skiing	0.0	0.0	0.0

[1] Survey respondents could select multiple activities, so this column may total more than 100%.

[2] Survey respondents were asked to select just one of their activities as their main reason for the forest visit. Some respondents selected more than one, so this column may total more than 100%.

Data Source: (U.S. Department of Agriculture 2016)

Table 15. Number of recreation facilities, facilities with fees, and on the reservation system, by site type.

Type	Facilities	Facilities with Fees	Reservation System
Campground (developed)	55	29	6
Camping Area (dispersed)	53	0	0
Group Campground	3	0	1
Visitor Centers	3	0	0
Picnic Day Use Site	12	0	1
Pavilion	3	0	2
Cabin/Lookout	16	11	12
Boat Launch	3	0	0

Type	Facilities	Facilities with Fees	Reservation System
River Access/Boating Site[1]	5	3[1]	0
Trailheads	40	0	0
Interpretive Sites	12	0	0
Fishing Sites	3	0	0
Snow Park/ Snow Play	4	0	0
Total	212	43	22

[1]Fee at boating site is for floating permit on main Salmon River. Data Source: INFRA

Table 16. Number of dispersed recreation sites by site type on Nez Perce-Clearwater ranger districts.

District	Overnight[1]	River[2]	Trailhead	Snow[3]	Day[4]	Total
Salmon	225	0	26	0	16	267
Red River	228	1	35	1	11	276
Moose Creek	69	2	6	1	6	84
Palouse	139	0	12	0	8	159
North Fork	249	1	16	0	23	289
Lochsa	331	10	14	1	28	384
Total	1241	14	109	3	92	1459

Note: Dispersed sites are development class 0-2 and were queried this way in the INFRA database.

[1]Overnight includes campgrounds, camping areas, group campgrounds, cabins and lookouts

[2]River includes boating sites, fishing sites and swimming sites

[3]Snow includes snow parks and snow play areas

[4]Day includes day use areas, interpretive sites and observation sites

Data Source: INFRA.

Table 17. Recreation special uses by type and district.

District	Isolated Cabin	Non-Commercial Group	Outfitter and Guide	Private Camp	Recreation Event	Resort
Salmon	0	0	11	0	0	0
Red River	1	0	8	0	0	1
Moose Creek	0	0	11	0	0	0
Palouse	0	1	2	0	0	0
North Fork	0	0	9	0	1	0
Lochsa	0	0	12	2	1	1
Total	1	1	53	2	2	2

Date Source: Special Uses Database queried September 2019.

Recreation trends will continue to evolve over time and visitor use will likely increase as the population increases. We anticipate similar types of use to occur in the future and we expect overall that use will increase, though some specific use categories may see decreases over the planning cycle.

Lands and Special Uses

The Nez Perce-Clearwater administers multiple types of non-recreation lands uses authorized by permits, term-permits, leases, and easements ranging from research activities to more extensive uses such as water systems, communications facilities, roads, and utilities. Over half of the 389 currently issued land use authorizations are for transportation purposes, such as highways and roads for private land access, and water systems serving private property, such as ditches and water lines. Table 18 summarizes the types of use on the Nez Perce-Clearwater and the number of authorizations issued. The Forest will continue to be responsive to requests for special use permits over the life of the plan. It is not possible to predict the number of authorizations that may be requested in the future; however, we expect these types of authorizations to continue.

Table 18. Lands Uses Authorizations (Use codes 200-999).

Type of Use	Use codes	Number of authorizations
Agriculture	211-241	7
Community and Public Information Meetings	311-374	15
Feasibility, Research, Training, Cultural Resources, and Historical Feasibility	411-452	3
Industry	511-541 and 561-595	23
Energy and Gas Transmission	611-644	13
Transportation	711-771	227
Communication Uses	800-899	36
Water, Water Transmission	911-951	65
Total	n/a	389

Information taken from Special Uses Database System as of February 12, 2019

Other Management Direction

The Wilderness Act and Designated Wilderness

Approximately 1,139,059 acres, just under 30 percent, of the Nez Perce-Clearwater is within three designated wildernesses. Portions of the Frank Church–River of No Return, portions of the Selway-Bitterroot, and the Gospel Hump wilderness areas lie within the Nez Perce-Clearwater.

Table 19. Wilderness with acres on the Nez Perce-Clearwater

Wilderness	Jurisdiction (National Forest)	NPCLW (size in acres)	Total (size in acres)
Selway-Bitterroot	Bitterroot, Lolo[3] and Nez Perce-Clearwater[4]	823,151	1,348,663
Frank Church-River of No Return	Boise[1], Bitterroot, Nez Perce-Clearwater, Payette and Salmon-Challis[2] and BLM lands	110,236	2,359,948
Gospel-Hump	Nez Perce-Clearwater	205,672	205,672

[1] Management of acres located on the Boise National Forest have been assigned to the Challis National Forest (now combined with the Salmon to form the Salmon-Challis National Forest)

[2] The Salmon-Challis National Forest is the lead agency for management of the Frank Church-River of No Return, pursuant to plan direction for the appropriate Forest.

[3] Management of acres located on the Lolo National Forest have been assigned to the Bitterroot National Forest

[4] The Bitterroot National Forest is the lead agency for management of the Selway-Bitterroot Wilderness, pursuant to plan direction for the appropriate Forest.

Table 20. Acres of the Nez Perce-Clearwater inside and outside of the Bitterroot Recovery Zone

Nez Perce-Clearwater National Forests	Acres	Percent
Acres within the Bitterroot Recovery Zone	935,715*	23.7%
Acres outside the Bitterroot Recovery Zone	3,003,341	76.2%

Nez Perce-Clearwater National Forests	Acres	Percent
Total acres	3,939,056	100%

*The Bitterroot Recovery Zone contains the Magruder corridor, which is not wilderness. Therefore, the Bitterroot Recovery Zone is slightly bigger than the wilderness areas.

Wilderness management is governed not only by the Revised Forest Plan but by law, and policy. Wilderness management restricts many activities that can affect federally listed species. The Wilderness Act states that a wilderness area is to be managed so that it is "untrammeled by man" and "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." It also directs agencies to manage wilderness to preserve natural ecological conditions. The act directs the management of wilderness "for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character."
Section 4(c) of the Wilderness Act states the following regarding roads:

> *"Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area."*

The Wilderness Act also prohibits motorized or mechanical entry, via cars, trucks, off-road or all-terrain vehicles, bicycles, aircraft, or motorboats, except in emergencies and in specified circumstances. The exceptions to motorized prohibitions are very narrow and rarely used.

Forest Service Policy also governs management of wilderness areas. Forest Service Manual 2320 includes the following direction:

- Where there are alternatives among management decisions, wilderness values shall dominate over all other considerations except where limited by the Wilderness Act, subsequent legislation, or regulations.
- Manage the use of other resources in wilderness in a manner compatible with wilderness resource management objectives.
- In wildernesses where the establishing legislation permits resource uses and activities that are nonconforming exceptions to the definition of wilderness as described in the Wilderness Act, manage these nonconforming uses and activities in such a manner as to minimize their effect on the wilderness resource.
- Cease uses and activities and remove existing structures not essential to the administration, protection, or management of wilderness for wilderness purposes or not provided for in the establishing legislation.
- Because wilderness does not exist in a vacuum, consider activities on both sides of wilderness boundaries during planning and articulate management goals and the blending of diverse resources in forest plans. Do not maintain buffer strips of undeveloped wildland to provide an informal extension of wilderness. Do not maintain internal buffer zones that degrade wilderness values. Use the Recreation Opportunity Spectrum (FSM 2310) as a tool to plan adjacent land management.

- Manage each wilderness as a total unit and coordinate management direction when they cross other administrative boundaries.
- Use interdisciplinary skills in planning for wilderness use and administration.
- Gather necessary information and carry out research programs in a manner that is compatible with the preservation of the wilderness environment.
- Whenever and wherever possible, acquire non-Federal lands located within wildernesses, as well as non-Federal lands within those areas recommended for inclusion in the system.
- Inform wilderness visitors that they face inherent risks of adverse weather conditions, isolation, physical hazards, and lack of rapid communications, and that search and rescue may not be as rapid as expected in an urban setting in all publications and personal contacts.
- Manage primitive areas as wilderness areas consistent with 36 CFR 293.17 until their designation as wilderness or to other use is determined by Congress.

It's the five qualities of wilderness character that the agency leans on as a way to monitor to meet the intent of the Act. So, as a matter of policy, managing an area to be untrammeled, natural, and undeveloped is managing for grizzly bear and other wildlife special features such as lynx or wolverine for example. The existing wilderness areas are managed in order to preserve wilderness character. Five qualities help describe wilderness character (Landres et al. 2015).

- Untrammeled-- Wilderness is essentially unhindered and free from modern human control or manipulation.
- Naturalness-- Wilderness ecological systems are substantially free from the effects of modern civilization.
- Undeveloped-- Wilderness is essentially without permanent improvements or modern human occupation.
- Outstanding opportunities for solitude or a primitive and unconfined type of recreation— Wilderness provides outstanding opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge.
- Other features of value-- Wilderness may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

With certain very limited exceptions, the Act prohibits motorized equipment, structures, installations, roads, commercial enterprises, aircraft landings, and mechanical transport. The Act permits mining access to private lands, fire control, insect and disease control, grazing, water resource structures (upon the approval of the President), and visitor use. Restricted or prohibited activities include road building, motorized and mechanized uses, construction of structures or recreation sites, timber harvest, and in the case of the Selway Bitterroot and Frank Church-River of No Return, mineral rights were withdrawn. So, no new mineral or mining activities are allowed. Fire suppression activities are only allowed under certain conditions but are otherwise allowed to burn naturally. These measures would ensure that wilderness areas provide wild landscapes with little human alteration, little access, and fewer visitors. Thus, designated wilderness areas provide ecological conditions to contribute to recovery of federally listed species because this management framework restricts many activities that could affect listed species.

Wilderness management does not restrict grazing, recreational uses, nor does it address management of food/attractants. The Nez Perce-Clearwater National Forests do not have restrictions on management of food or attractants in place currently.

While grazing is allowed in wilderness, there are only 380 acres of one vacant allotment in the Selway-Bitterroot wilderness area. So, this activity is not currently occurring within the Selway-Bitterroot and Frank Church Wilderness Areas nor within the Bitterroot Recovery Zone within the boundaries of the plan area. However, the vacant allotment at some point may again become active. The Central Wilderness Act (1980), which was the enabling legislation for the Selway-Bitterroot and Frank Church River of No Return Wilderness areas, provided some allowance of grazing. It states:

"Within the River of No Return Wilderness and the Selway-Bitterroot Wilderness additions designated by this Act…the grazing of livestock were established prior to the date of enactment of this Act, shall be permitted to continue subject to such reasonable regulations as the Secretary deems necessary, as provided in paragraph 4(d)(4) of the Wilderness Act."

This language suggests that new grazing allotments not established prior to 1980 would be restricted within the Selway-Bitterroot and Frank Church River of No Return Wilderness Areas.

The National Wild and Scenic Rivers Act and Designated Wild and Scenic Rivers

Congress passed the National Wild and Scenic Rivers System Act in 1968 (Pub. L. 90-542; 16 U.S.C. 1271 et seq.) for the purpose of preserving rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The act promotes river management across political boundaries and public participation in developing goals for river protection. Management of the existing Wild and Scenic Rivers enhances and protects habitats for future grizzly bear occupancy within wild and scenic river corridors. Designated wild and scenic river distribution will not change in the revised forest plan. Instead, the plan will set management direction for these rivers and their corridors.

The Nez Perce-Clearwater has three designated Wild and Scenic Rivers: Middle Fork Clearwater River, Salmon River, and Rapid River. The Middle Fork Clearwater includes portions of the Lochsa and Selway Rivers. On the Nez Perce-Clearwater, designated rivers include 64 miles of the Lochsa River from the Powell Ranger Station to Lowell, Idaho; 58 miles of the Selway River from the Nez Perce National Forest boundary with the Bitterroot National Forest near Goat Creek to Lowell, Idaho; and 23 miles of the Middle Fork Clearwater River from Lowell, Idaho, to the Upper Kooskia Bridge in Kooskia, Idaho. Portions of the Selway and Salmon rivers flow through the Bitterroot Recovery Zone.

The lands surrounding the designated Wild and Scenic Rivers were included as Wild and Scenic River corridors and are managed in connection with the Wild. The Nez Perce-Clearwater National Forests contains approximately 57,891 acres of Designated Wild and Scenic River corridors within the administrative boundary.

Management of wild and scenic rivers is governed by the Wild and Scenic Rivers Act of October 2, 1968 (Pub. L. 90-542, 82 Stat. 906, as amended). This act established the National Wild and Scenic Rivers System with three classes of river systems: wild, scenic, and recreational. The purpose of the act is to protect the river "for the benefit and enjoyment of present and future generations."

For management purposes, river segments are classified as *wild*, *scenic*, or *recreational*.

- Wild River: Those rivers or sections of rivers that are 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 River: Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped but accessible in places by roads.
- Recreational River: Those rivers or sections of rivers that are readily accessible by road or railroad that may have some development along their shorelines and that may have undergone some impoundment or diversion in the past.

When designated, the five river segments were defined and classified as either wild or recreational segments. No segments were classified as scenic. Those river segments with adjacent roads were designated recreational and the others wild. The different classifications are associated with a variety of restrictions on activities such as timber harvest, the development of facilities and motorized routes. The acres of designated wild and scenic river corridors are shown in table 22. Of the total five segments, four lie within the Nez Perce-Clearwater. Those segments are described in table 21.

Table 21. Classification of Middle Fork Clearwater Wild and Scenic River within Nez Perce-Clearwater

River	Segment	Miles	Classification	Designating Legislation
Lochs	Powell Ranger Station to Lowell	64	Recreational	Wild and Scenic Rivers Act, 1968
Middle Fork Clearwater	Lowell to Kooskia	23	Recreational	Wild and Scenic Rivers Act
Selway	Lowell to Selway-Bitterroot Wilderness boundary	22	Recreational	Wild and Scenic Rivers Act
Selway[1]	Selway-Bitterroot Wilderness boundary to the Bitterroot National Forest boundary	36	Wild	Wild and Scenic Rivers Act
Rapid River	Segment located on the Nez Perce-Clearwater	13	Wild	Hells Canyon National Recreation Area Act, 1975
Salmon	Salmon Falls to Long Tom Bar	56	Wild	Central Idaho Wilderness Act, 1980

[1]This river system contains additional miles within the administrative boundaries of the Bitterroot National Forest.

Table 22. The acres within designated Wild and Scenic River corridors by classification within the Nez Perce-Clearwater National Forests

River Name	Acres Recreational	Acres Scenic	Acres Wild	Total
Middle Fork Clearwater (includes the Lochsa, Selway, and Middle Fork Clearwater Rivers)	32,751	0	11,631	44,382
Middle Fork Clearwater (includes the Lochsa, Selway, and Middle Fork Clearwater Rivers)	32,751	0	11,631	44,382
Rapid River	4341	0	0	4341
Salmon	0	0	9164	9,164

Note, additional acres of designated wild and scenic river corridors extent outside the plan area.

Section (section 3(d)(1)) of the wild and scenic rivers act requires federal agency charged with the administration of each component of the national wild and scenic rivers system (designated wild and scenic rivers) to prepare a comprehensive management plan to provide for the protection of the river's outstandingly remarkable values. thus, designated wild and scenic rivers have a comprehensive management plan that provides direction for its management. these plans provide guidance similar to plan components that guide management of the Wild and Scenic Rivers to protect outstandingly remarkable values.

Under the Wild and Scenic River Act, outstandingly remarkable values were assigned to all segments of the Middle Fork Clearwater River. In 2002, as part of the Snake River Basin water rights adjudication, the outstanding remarkable values were validated for all segments of the river. During the validation process in 2002, the determination was made that all the original outstandingly remarkable values should still be defined for the Middle Fork Clearwater, with one exception. Geology was not defined as an outstandingly remarkable value in 2002 but was in 1968. The other outstandingly remarkable values were defined in both 1968 and 2002. These values include scenery; recreation; fish; wildlife; prehistory, history, and, potentially, traditional, and cultural use; water quality; and vegetation and botany.

The Middle Fork Clearwater River and its tributaries play a vital role in the Nez Perce-Clearwater management of sensitive, threatened, and endangered fish species. The Middle Fork Clearwater subbasin is considered a core area for recovery of at-risk salmonids in the upper Columbia River basin. The river and its tributaries provide crucial habitat for threatened and endangered species listed on the Endangered Species Act, including steelhead trout (*Oncorhynchus mykiss* subspecies) and bull trout (*Salvelinus confluentus*), which have also been identified as having outstanding remarkable value in this drainage. Additionally, hatchery spring chinook salmon have been reintroduced to the river system and are currently listed as a U.S. Forest Service Northern Region Species of Conservation Concern, as is pacific lamprey. The Middle Fork Clearwater River functions as a critical migration corridor, connecting the Lochsa and Selway populations of listed fish within the South Fork Clearwater and Lower Clearwater River and tributaries. It affords relatively contiguous distribution of populations and suitable habitat so that the biological needs of these species can be met (U.S. Department of Agriculture 2002) Designated Wild and Scenic River management benefit federally listed species either indirectly or directly.

The river corridor provides a diversity of high-quality habitat for wildlife of national and regional significance and these were identified as outstandingly remarkable values. The 2002 assessment of Endangered Species Act listed species included the bald eagle, gray wolf, lynx, and grizzly bears (U.S. Department of Agriculture 2002)(U.S. Department of Agriculture, Forest Service, 2002a). The river corridor and adjacent areas continue to provide habitat for these species. Designated Wild and Scenic rivers will not change in the revised forest plan. Instead, the plan will set management direction for these rivers and their corridors.

Idaho Roadless Rule

Idaho Roadless Rule Areas

Idaho's Roadless Areas make up the core of the last intact forest ecosystem in the lower 48 states. The U.S. Forest Service adopted a state-specific, final rule establishing management direction for designated roadless areas in the State of Idaho. The final rule designated 250 Idaho Roadless Areas (IRAs) and establishes five management themes that provide prohibitions with exceptions or conditioned permissions governing road construction, timber cutting, and discretionary mineral development (36 CFR Part 294 Federal Register/Vol. 73, No. 201). The Nez Perce-Clearwater National Forests contains approximately 1,481,565 acres of Idaho Roadless Rule area. Areas were divided into themes by the Idaho Roadless Rule and are managed differently within each theme. The acres of the different themes are shown in the table below. A map of the different Idaho Roadless Rule themes are shown below in table 23.

Table 23. The Idaho Roadless Rule Themes and approximate acres of each of them within the plan area

Idaho Roadless Rule Theme	Approximate Acres within the Forest
Backcountry Restoration	835,649
Forest Plan Special Areas	38,278
Primitive	311,154
Special Area of Historic or Tribal Significance	49,341
Wildland Recreation	247,133
Total	1,481,565

Acres differ from those reported in Chapter 2 of the EIS which is reported at 1,481,636 due to slight changes in calculated acres due to overlay errors in GIS that occurred when calculating secure habitat

Idaho Roadless Rule Areas make up approximately 37.6 percent of the plan area. The majority of Idaho Roadless Rule areas are distributed on the Clearwater National Forest, though significant Roadless Rule areas occur adjacent to the Selway Bitterroot Wilderness area and Frank Church Wilderness Area on the Nez Perce National Forest. The Idaho Roadless Rule restrictions and exceptions for each theme are summarized below and are shown in Figure 5 below.

Idaho Roadless Rule Themes

The following sections summarize and contrast the different management restrictions on activities within each Idaho Roadless Rule Theme. For a complete description of the prohibitions with exceptions or conditioned permissions within each theme see the Idaho Roadless Rule (36 CFR Part 294 Federal Register/Vol. 73, No. 201).

Wildland Recreation theme

Road Construction or Reconstruction

Prohibited except Regional Forester may authorize to meet statute, treaty, reserved or outstanding rights or other legal duty of the United States

Timber and Vegetation Management

Timber cutting, sale or removal is prohibited except for personal or administrative use or where incidental to the implementation of an activity not prohibited.

Minerals

Existing mineral leases can continue under leases, contracts, permits authorized before 10/16/2008. No change to minerals activities under General Mining Law of 1872. Roads will not be authorized for mineral leasing after 10/16/2008. Common variety mineral materials will not be sold after 10/16/2008.

Special area of historic and tribal significance theme

Road Construction or Reconstruction

Prohibited except Regional Forester may authorize to meet statute, treaty, reserved or outstanding rights or other legal duty of the United States.

Timber and Vegetation Management

Timber cutting, sale or removal is prohibited except: to improve threatened, endangered, proposed, or sensitive species habitat; to maintain or restore the characteristics of ecosystem composition, structure or processes; to reduce the risk of uncharacteristic wildland fire effects to an at-risk community or municipal water supply; for personal or administrative use or where incidental to the implementation of an activity not prohibited; where cutting, sale or removal is incidental to the implementation of a management activity not otherwise prohibited by this subpart. These actions must: Maintain or improve one or more of the roadless characteristics; Used existing roads or aerial harvest systems; Maximize the retention of large trees as appropriate for the forest type to the extent these trees promote fire-resilient stands; Are consistent with land management plan components; Approved by Regional Forester.

Minerals

Existing mineral leases can continue under leases, contracts, permits authorized before 10/16/2008. No change to minerals activities under General Mining Law of 1872. Roads will not be authorized for mineral leasing after 10/16/2008. Common variety mineral materials will not be sold after 10/16/2008.

Primitive theme

Road Construction or Reconstruction

Prohibited except Regional Forester may authorize to meet statute, treaty, reserved or outstanding rights or other legal duty of the United States.

Timber and Vegetation Management

Timber cutting, sale or removal is prohibited except: to improve threatened, endangered, proposed, or sensitive species habitat; to maintain or restore the characteristics of ecosystem composition, structure or processes; to reduce the risk of uncharacteristic wildland fire effects to an at-risk community or municipal water supply; for personal or administrative use or where incidental to the implementation of an activity not prohibited; where cutting, sale or removal is incidental to the implementation of a management activity not otherwise prohibited by this subpart. These actions must: Maintain or improve one or more of the roadless characteristics; Used existing roads or aerial harvest systems; Maximize the retention of large trees as appropriate for the forest type to the extent these trees promote fire-resilient stands; Are consistent with land management plan components; Approved by Regional Forester.

Minerals

Existing mineral leases can continue under leases, contracts, permits authorized before 10/16/2008. No change to minerals activities under General Mining Law of 1872. Roads will not be authorized for mineral leasing after 10/16/2008. Common variety mineral materials will not be sold after 10/16/2008.

Back country restoration theme

Road Construction or Reconstruction

Prohibited unless Regional Forester determines that: Road is needed for public health and safety for imminent threat of loss of life or property; or in Response to CERCLA, Clean Water Act or Oil Pollution, or Statute, treaty, reserved or outstanding rights or other legal duty of the United States; or Road realignment to prevent irreparable resource damage that can't be mitigate by normal road maintenance for roads essential for public or private access, natural resource management, or public health or safety; or Road reconstruction for road safety on a road determined to be hazardous; or Secretary of Agriculture determines a Federal Aid Highway (Title 23 of the U.S. Code) is warranted.

Timber and Vegetation Management

Timber cutting, sale or removal is prohibited except: to improve threatened, endangered, proposed, or sensitive species habitat; to maintain or restore the characteristics of ecosystem composition, structure or processes; to reduce the risk of uncharacteristic wildland fire effects to an at-risk community or municipal water supply; for personal or administrative use or where incidental to the implementation of an activity not prohibited; where cutting, sale or removal is incidental to the implementation of a management activity not otherwise prohibited by this subpart. These actions must: Maintain or improve one or more of the roadless characteristics; Used existing roads or aerial harvest systems; Maximize the retention of large trees as appropriate for the forest type to the extent these trees promote fire-resilient stands; Are consistent with land management plan components; approved by Regional Forester.

Minerals
Existing mineral leases can continue under leases, contracts, permits authorized before 10/16/2008. No change to minerals activities under General Mining Law of 1872. Roads will not be authorized for mineral leasing after 10/16/2008 but surface use or mineral leasing without road construction or reconstruction may occur if consistent with Forest Plan. The use or sale of common variety mineral materials and associated road construction to access them may be authorized only if the use of these materials is incidental to an activity otherwise permissible in the backcountry.

Back country restoration theme- community protection zones

Road Construction or Reconstruction
Responsible official may authorize temporary road construction/reconstruction for community protection zone activities if these can't be reasonably accomplished without a road.

Timber and Vegetation Management
Same as backcountry restoration plus: To reduce hazardous fuels conditions within the community protection zone if it generally retains large trees and is consistent with land management plan.

Minerals
Existing mineral leases can continue under leases, contracts, permits authorized before 10/16/2008. No change to minerals activities under General Mining Law of 1872. Roads will not be authorized for mineral leasing after 10/16/2008 but surface use or mineral leasing without road construction or reconstruction may occur if consistent with Forest Plan. The use or sale of common variety mineral materials and associated road construction to access them may be authorized only if the use of these materials is incidental to an activity otherwise permissible in the backcountry.

Forest plan special areas theme

Road Construction or Reconstruction
Management under current forest plan not changed by Idaho Roadless Rule.

Timber and Vegetation Management
Management under current forest plan not changed by Idaho Roadless Rule.

Minerals
Management under current forest plan not changed by Idaho Roadless Rule.

The roadless rule allows motorized travel on existing roads and trails to continue. Decisions concerning future management of roads and trails are made in applicable travel management process. Grazing under existing grazing permits are not affected by the Idaho Roadless Rule. Motorized equipment and mechanical transport do not change under the Idaho Roadless Rule.

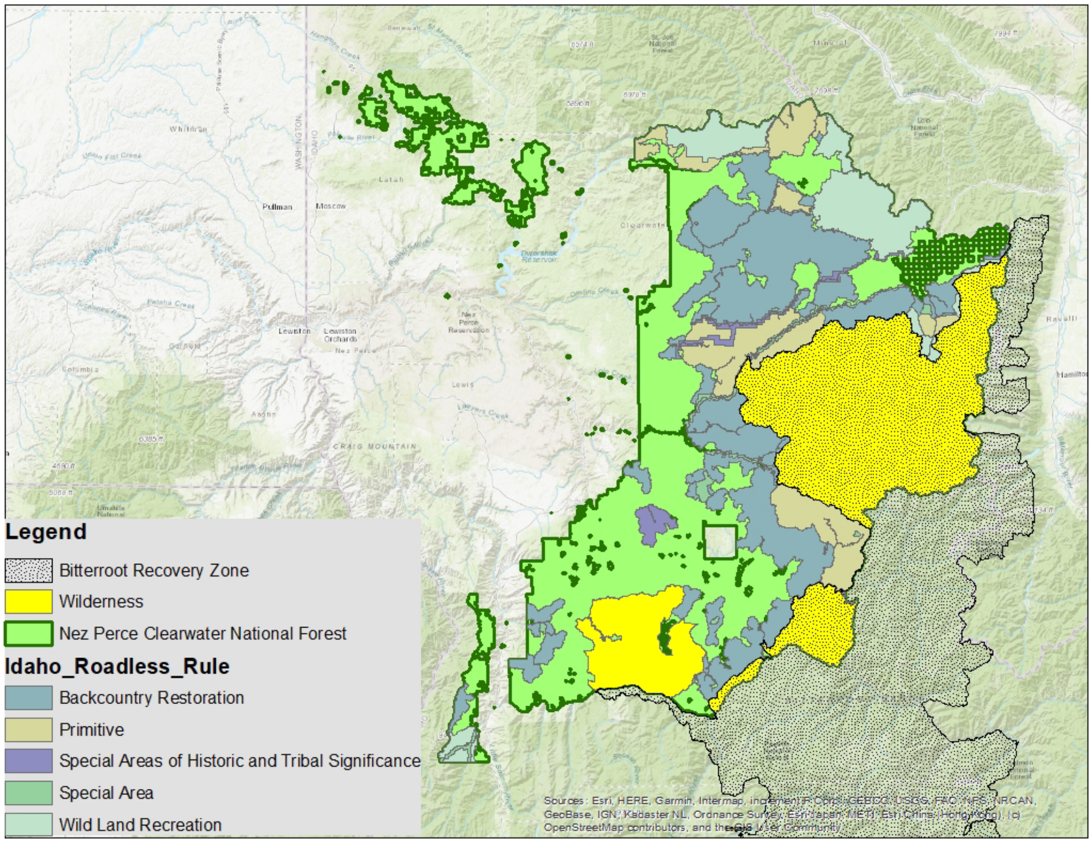

Figure 5. The distribution of Idaho Roadless Rule Areas in relation to wilderness and the Bitterroot Recovery Zone

Aquatic Resources Assessment

Bull Trout and Critical Habitat

In November 1999, the Columbia River Distinct Population Segment (DPS) of Bull Trout was listed by the U.S. Fish and Wildlife Service as a Threatened species pursuant to the Endangered Species Act of 1973, as amended (U.S. Department of the Interior 1999). Within the footprint of the revised plan, the Columbia River DPS is divided into two Recovery Units, two Geographic Areas, and several Core Areas (table 25, figure 6 & figure 7; (U.S. Department of the Interior 2015c). Core areas have been further divided into local populations by the bull trout recovery unit implementation plans (U.S. Department of the Interior 2015b).

Table 24. Bull Trout Endangered Species Act hierarchical unit structure within the plan area.

Distinct Population Segment (DPS)	Recovery Unit	Geographic Region	Core Area
Columbia River DPS	Mid-Columbia	Lower Snake	North Fork Clearwater River
Columbia River DPS	Mid-Columbia	Lower Snake	Lochsa River (including LR Fish Lake)
Columbia River DPS	Mid-Columbia	Lower Snake	Selway River
Columbia River DPS	Mid-Columbia	Lower Snake	South Fork Clearwater River
Columbia River DPS	Upper Snake	Salmon River	Little Lower Salmon River
Columbia River DPS	Upper Snake	Salmon River	Middle Salmon River - Chamberlain

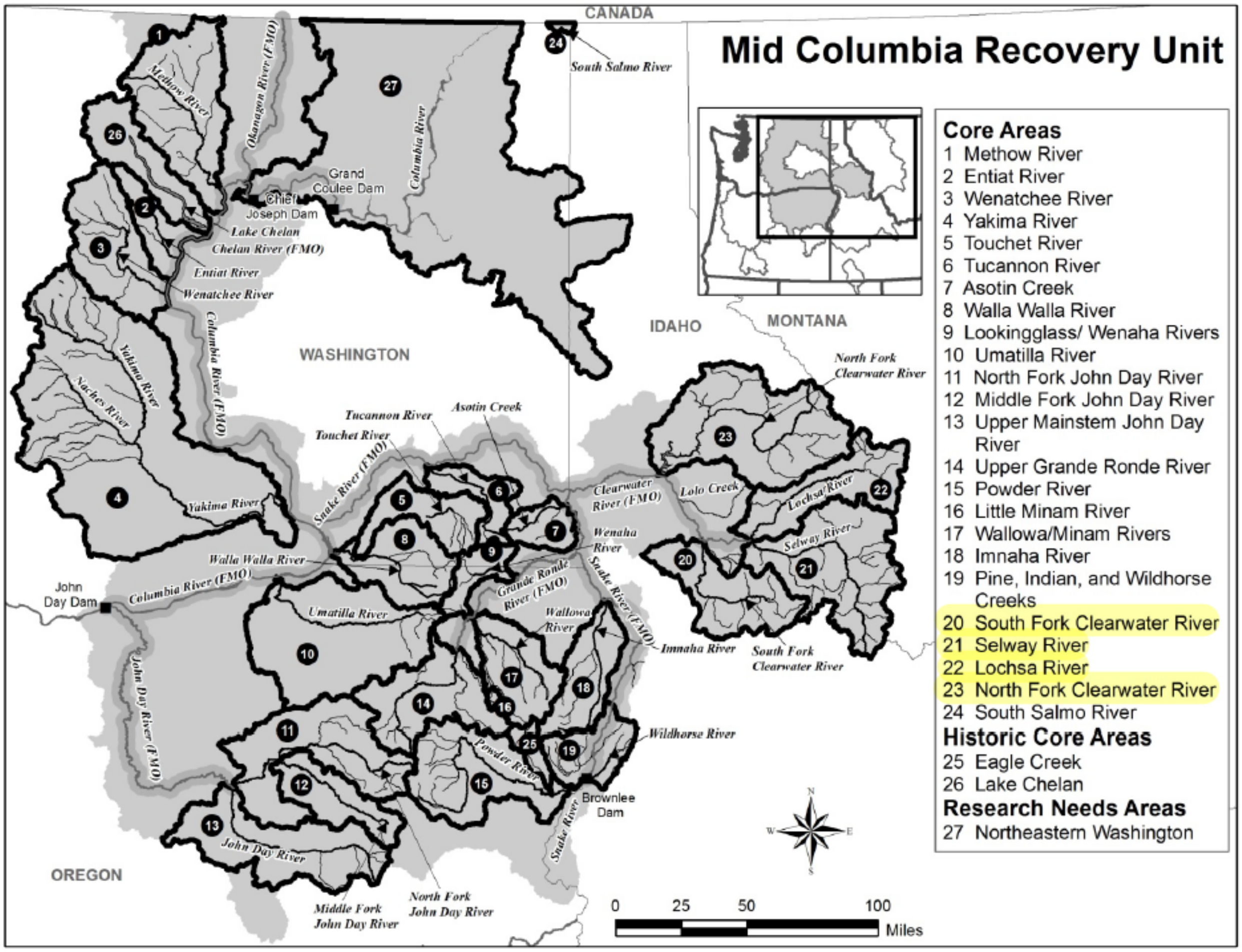

Figure 6. Bull Trout Core Areas in the Mid-Columbia Recovery Unit; Core Areas within the revised forest plan area are highlighted.

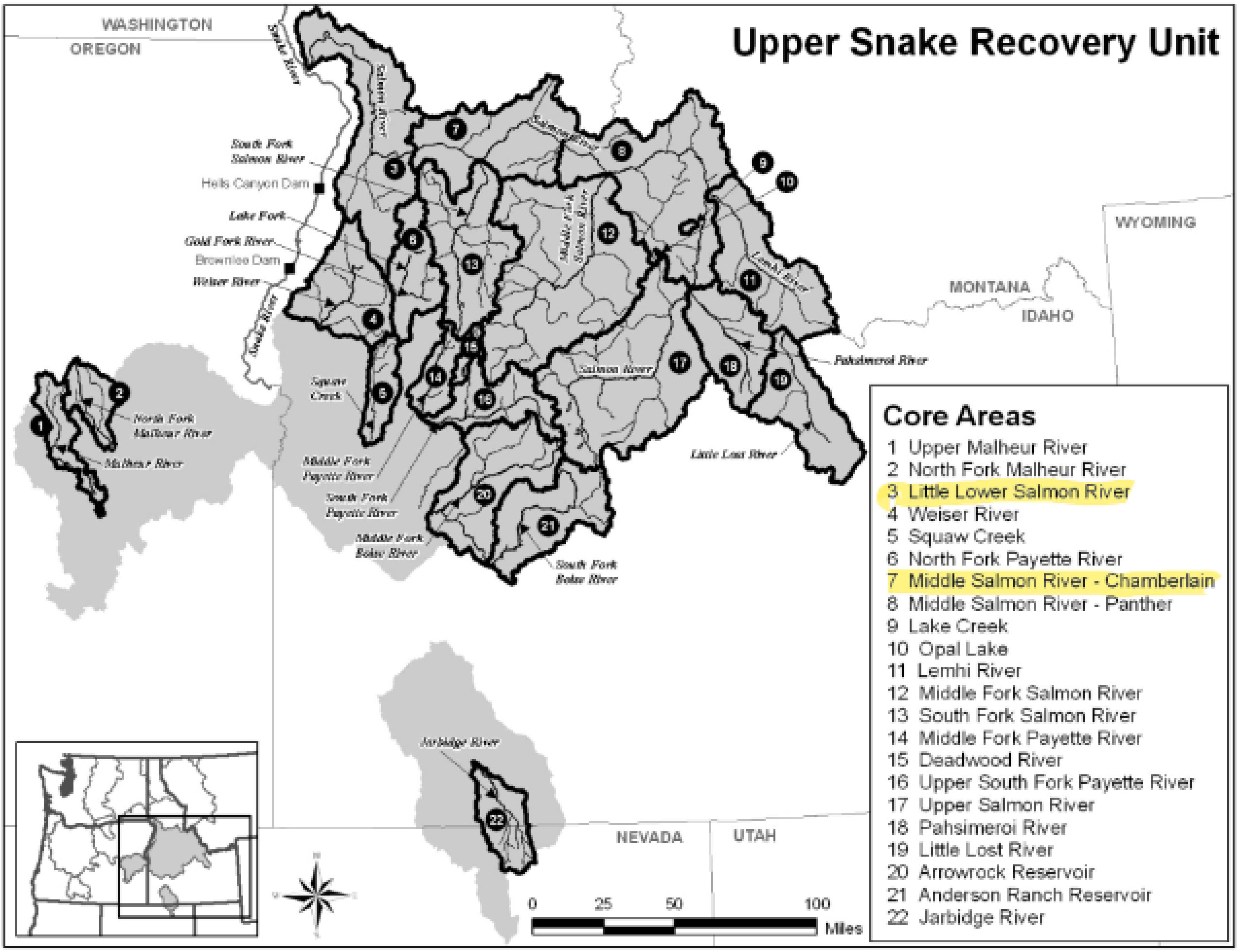

Figure 7. Bull Trout Core Areas in the Upper Snake Recovery Unit; Core Areas within the revised forest plan area are highlighted.

Bull Trout critical habitat was designated 2010 and includes spawning and rearing, and foraging, migration, and overwintering habitats (U.S. Department of the Interior 2010). The revised plan action area includes Critical Habitat Unit 21: Clearwater River which is comprised of approximately 1,680 miles of critical habitat streams and two critical habitat lakes.

Migratory and resident bull trout life histories are present throughout most of the project area as spawning and rearing is known to occur in 59 local populations. This makes bull trout the Federally listed aquatic species with the greatest probability of being affected by forest management actions. However, it is important to note that almost all core areas in the action area (North Fork Clearwater, Lochsa, Selway, Little Lower Salmon, and Middle Salmon-Chamberlain) have substantial portions of the watershed in either wilderness or Idaho roadless area which has kept habitat in near-reference condition and greatly reduces the risk of potential future project effects. Bull trout streams in MA3 are therefore subject to the most potential risk from future project effects and projects in these areas will be guided by revised plan components.

The current demographic status of bull trout in the Mid-Columbia and Upper Snake recovery units (RUs) are highly variable. Some core areas that are located outside of the Nez Perce-Clearwater National Forests, such as the Umatilla, Asotin, and Powder rivers contain populations so depressed they are likely suffering from the deleterious effects of small population size. Conversely, strongholds do exist within the RU, predominantly in the Lower Snake geographic area. For example, the local populations in the Clearwater River portion of the revised plan area likely have some of the highest bull trout abundances in the Mid-Columbia RU. These populations are completely or partially within the bounds of designated wilderness areas which affords protections that have kept aquatic and riparian habitat near reference condition. Most recent trend data suggests bull trout are increasing in the North Fork Clearwater, Lochsa, and Middle Salmon-Chamberlain core areas, and stable in the Little Lower Salmon and Selway core areas, (Meyer et al. 2014, U.S. Department of the Interior 2015b). USFWS has previously cited primary IDFG bull trout literature (Meyer et al. 2014) as showing that populations were declining in the South Fork Clearwater Core area (U.S. Department of the Interior 2015b), however the results of that study were inconclusive for the South Fork. Screw trap data from the South Fork Clearwater Core Area showed an increasing trend in abundance, while snorkeling data from the same area showed a decreasing trend in abundance, (U.S. Department of the Interior 2015b). Part of the data analysis conducted in that paper assessed the reliability of the data used, and the snorkeling data that showed a decreasing trend in abundance was found be unreliable due to high observation error (Meyer et al. 2014). The South Fork Clearwater core area is the only bull trout core area within the action area that has primary threats listed related to forest management: "Legacy impacts from forest practices, roads, and mining, as well as transportation corridors (historical and current) contribute to degradation in some SR tributaries and mainstem FMO habitat. Agricultural practices and improper grazing degrade habitat primarily in lower mainstem FMO habitat. Activities such as forest practices, mining, roads, and grazing in upland and riparian areas have contributed to instream degradation, loss of LWD, pool reduction, and sedimentation." See 'Management of Activities Likely to Occur' below for how proposed plan components would address these threats.

Snake River Basin Steelhead Trout and Critical Habitat

The Snake River Basin steelhead trout Distinct Population Segment (DPS; steelhead hereinafter) includes the anadromous form only and is currently listed as threatened under the Endangered Species Act August 18, 1997 (62 FR 43937) and January 5, 2006 (71 FR 833); updated April 14, 2014 (79 FR 20802), and July 26, 2022 (National Oceanic and Atmospheric Administration 2022a). The Snake River Basin steelhead DPS includes all anadromous populations that spawn and rear in the mainstem Snake River from its mouth to Hells Canyon Dam, and all tributaries except the North Fork Clearwater River above Dworshak Dam, construction of which blocked fish passage in 1973. Fish cultivated from six hatchery programs are also included in the DPS.

The Snake River Basin steelhead DPS is organized into six major population groups (MPGs) that are subdivided into 26 populations. The Clearwater and a portion of the Salmon River MPG are located within the Forests (table 25, Figure 8).

Table 25. Portions of the Distinct Population Segment that are on the Forests. The Lower Mainstem Clearwater is downstream of the Forest boundary. The Lower Mainstem Salmon River is not an identified population but is an important corridor to other MPGs in the Salmon

Distinct Population Segment	Recovery Domain	Management Unit	Major population groups (MPGs)	Populations on Forest
Snake River Basin Steelhead	Snake River	Idaho	Clearwater River	Lower Mainstem Clearwater River
Snake River Basin Steelhead	Snake River	Idaho	Clearwater River	Lolo Creek
Snake River Basin Steelhead	Snake River	Idaho	Clearwater River	Lochsa River
Snake River Basin Steelhead	Snake River	Idaho	Clearwater River	Selway River
Snake River Basin Steelhead	Snake River	Idaho	Clearwater River	South Fork Clearwater River
Snake River Basin Steelhead	Snake River	Idaho	Clearwater River	(extirpated) North Fork Clearwater
Snake River Basin Steelhead	Snake River	Idaho	Salmon River	Little Salmon River
Snake River Basin Steelhead	Snake River	Idaho	Salmon River	Lower Mainstem Salmon River

Critical Habitat was designated for the Snake River Basin steelhead DPS, effective January 2, 2006 (70 FR 52629) to include PBF's (originally called PCE's) for steelhead. It includes most of the watersheds on the Forest except for the Palouse River and North Fork Clearwater Rivers above Dworshak Dam, and select tributaries of the South Fork Clearwater River that were excluded after recommendations of the Critical Habitat Analytical Review Teams (CHART) review(U.S. Department of Commerce 2005b;a)

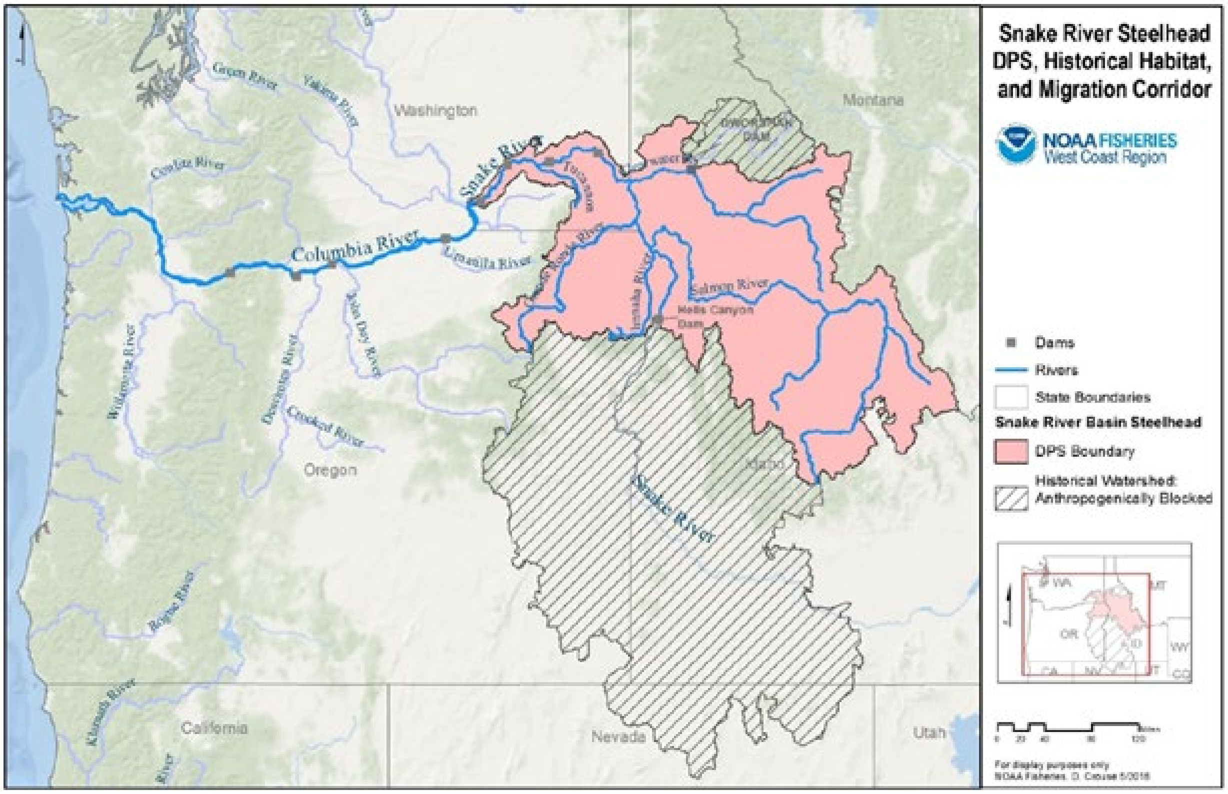

Figure 8. Historic and current distribution of the Snake River Basin steelhead DPS (National Oceanographic and Atmospheric Agency 2017).

Steelhead occupy most accessible streams on the Forests. Steelhead are present in most of the subbasins on the Forest including the Lochsa, Selway, Mainstem Clearwater, South Fork Clearwater, Middle Fork Clearwater, Salmon River, Lolo Creek, Little Salmon River, Chamberlain Creek, and the South Fork Salmon River. Steelhead differ from bull trout in that they're anadromous and travel to the ocean and back via larger mainstem rivers, including the mainstem Clearwater and Salmon rivers. On the Forest, steelhead are unlike bull trout in that much of the production comes from intermittent streams, which are sensitive to changes in summer baseflows, and management actions that affect pool formation and floodplain inundation. Steelhead are very widely distributed on the forest and are often present in streams that are too small or too warm to support other salmonid species. In summer they often rely on pools that have an influx of cold groundwater.

A biological viability assessment reported in 2022 (Ford 2022) that the Clearwater River Lower Mainstem and South Fork Clearwater River aggregate stocks are in a stable condition with an overall viability risk rating of 'highly viable' and 'viable', respectively. The aggregate Upper and Middle Fork Clearwater River stock, functionally consisting of the Lolo Creek and Lochsa and Selway River populations rate overall risk 'maintained.' The Clearwater River MPG therefore meets the specified criteria for a viable MPG (National Oceanic and Atmospheric Administration 2022c). The viability assessment also indicates all the Salmon River MPG's steelhead populations within the action area have an overall risk rating of 'maintained.'

Snake River Spring/Summer Chinook Salmon, Critical Habitat, and Essential Fish Habitat

Spring/summer Chinook are two of three ecotypes (commonly called runs) of Chinook that occur in Idaho and are classified by seasonal designations reflecting when adult Chinook enter freshwater to begin their spawning migration. Spring/summer chinook spawn and rear in most rivers on the forest (Clearwater, Lochsa, Selway, Salmon) and their larger tributaries. The Snake River spring/summer Chinook Salmon Evolutionarily Significant Unit (ESU) was listed as Threatened on April 22, 1992 (57 FR 27160); Threatened status was reaffirmed May 26, 2016 (81 FR 33468) and July 26, 2022. The Snake River Spring/Summer Chinook Salmon ESU includes all naturally spawned populations of spring/summer Chinook salmon originating in the mainstem Snake River and the Tucannon River, Salmon River, Grande Ronde River, and Imnaha River. On June 28, 2005, NOAA Fisheries announced a final policy addressing the role hatchery origin salmon and steelhead in listing determinations under the ESA (70 FR 37204, Hatchery Listing Policy):

“This policy establishes criteria for including hatchery stocks in ESUs and DPSs. In addition, it:

(1) provides direction for considering hatchery fish in extinction risk assessments of ESUs and DPSs;

(2) requires that hatchery fish determined to be part of an ESU or DPS be included in any listing of the ESU or DPS;

(3) affirms our commitment to conserving natural salmon and steelhead populations and the ecosystems upon which they depend; and

(4) affirms our commitment to fulfilling trust and treaty obligations regarding the harvest of Pacific salmon and steelhead populations, consistent with the conservation and recovery of listed salmon ESUs and steelhead DPSs.” (NOAA 2022)

The Snake River Spring/summer Chinook ESU now includes wild fish as well as fish cultivated from 14 specific hatcheries, including the Tucannon River Program; Lostine River Program; Catherine Creek Program; Lookingglass Hatchery Program; Upper Grande Ronde Program; Imnaha River Program; Big Sheep Creek Program; McCall Hatchery Program; Johnson Creek Artificial Propagation Enhancement Program; Pahsimeroi Hatchery Program; the Sawtooth Hatchery Program; the Yankee Fork Program; the Dollar Creek Program; and the Panther Creek Program (70 FR 37159; 85 FR 81822).

The ESU population was extirpated from the entire Clearwater River basin due to the construction of Lewiston Dam (1927 – 1973). Subsequent introductions of hatchery chinook from other out-of-basin populations “altered or eliminated any possible remnants of the original gene pool” (National Oceanic and Atmospheric Administration 2017). In addition, all anadromous fish were further excluded from the North Fork Clearwater River subbasin by the construction of Dworshak Dam in 1973. As a result, Clearwater River Spring/summer Chinook are not ESA listed, and are not included in the ESU.

Table 26. Organizational structure of the Snake River spring and summer Chinook Salmon ESU relevant to the Forests.

Evolutionarily Significant Unit	Recovery Domains	Sub-Domains	Management Unit	Basins	MPGs on Forest	Rivers
Snake River spring/summer Chinook	Interior Columbia	Snake River	Idaho	Salmon River Basin	Upper Salmon River MPG	Lower Salmon River
Snake River spring/summer Chinook	Interior Columbia	Snake River	Idaho	Salmon River Basin	South Fork Salmon River MPG	Little Salmon River

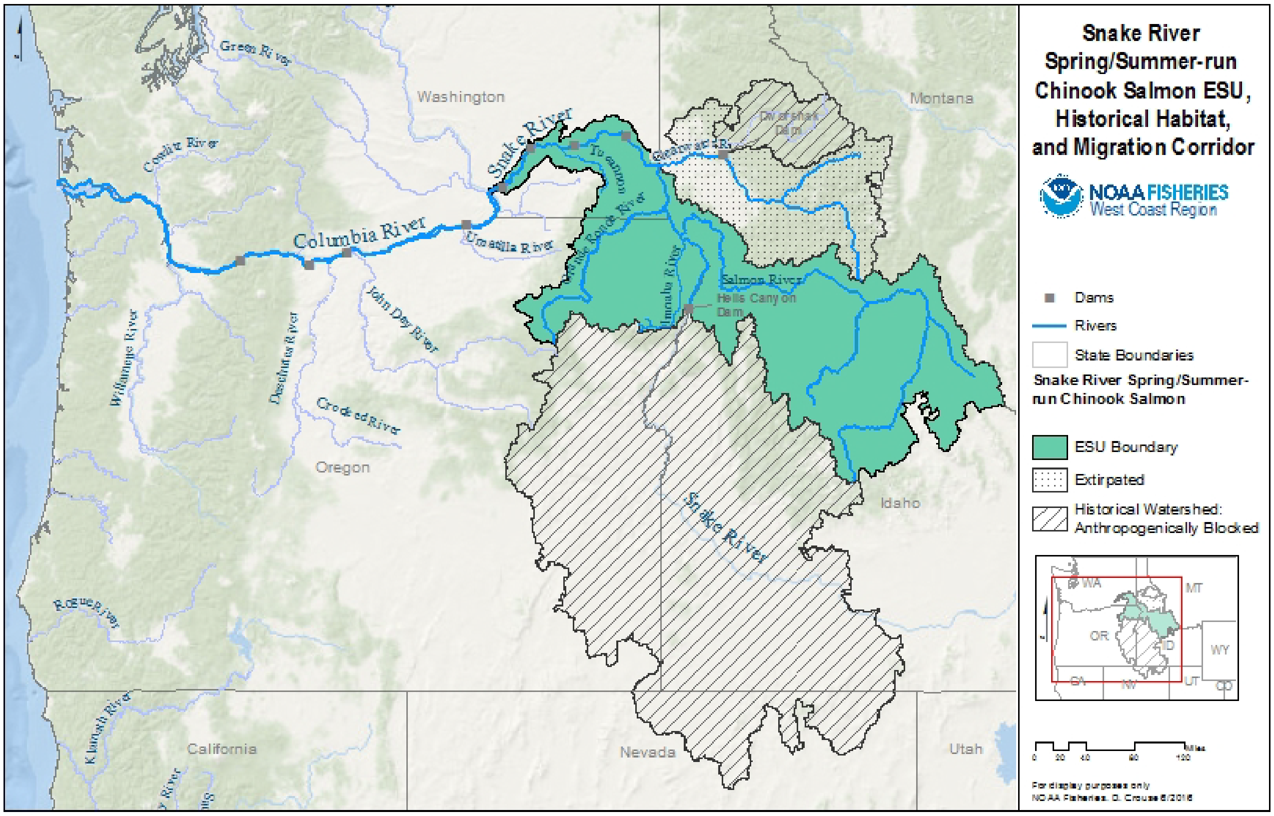

Figure 9. Historical and current distribution of the evolutionarily significant unit. Note that the current distribution does not include the Clearwater River subbasin

Critical Habitat for Snake River spring and summer Chinook Salmon was designated on December 28, 1993 (58 FR 68543) and revised on October 25, 1999 (64 FR 57399). Critical Habitat includes the "Columbia, Snake, and Salmon Rivers and all the tributaries of the Snake and Salmon Rivers (except the Clearwater River) presently or historically accessible to Snake River spring/summer Chinook Salmon (except above natural falls and the Hells Canyon Dam)" (National Oceanic and Atmospheric Administration 2017). Critical Habitat was designated with the aim of encapsulating specific PBFs (National Oceanic and Atmospheric Administration 2017). The subbasins managed by the Forests are also Essential Fish Habitat for Chinook Salmon under the Magnuson-Stevens Act (1976, as amended).

A biological viability assessment reported in 2022 (Ford 2022) that the Upper Salmon and South Fork Salmon river MPGs have a 'high' overall viability risk rating. This is because despite improvements in abundance/productivity in several populations relative to the time of listing, most populations of salmonids in the western United States have experienced sharp declines in abundance in the recent five-year period, primarily due to variation in ocean survival (National Oceanic and Atmospheric Administration 2022b).

Snake River Fall Chinook Salmon, Critical Habitat, and Essential Fish Habitat

The Snake River fall Chinook Salmon ESU was listed as a threatened species under the Endangered Species Act on April 22, 1992 (57 FR 14653). This listing was revisited in 2005, and 5-year reviews in 2010, 2016, and 2022 found that threatened status remained appropriate (National Oceanic and Atmospheric Administration 2009, Ford 2011, National Oceanic and Atmospheric Administration 2016;2022c). The ESU includes all naturally-spawned fall-run Chinook Salmon from the mainstem Snake River below Hells Canyon Dam, and from the Tucannon River, Grande Ronde River, Imnaha River, and the Salmon and Clearwater rivers (table 27). Fish cultivated from four hatchery programs are also included in the ESU including the Lyons Ferry Hatchery Program, the Fall Chinook Acclimation Ponds Program, the Nez Perce Tribal Hatchery Program, and the Idaho Power Program (formerly called the Oxbow Hatchery Program).

Table 27. Organizational structure of the Snake River Fall Chinook Salmon evolutionarily significant unit relevant to the Forests

Evolutionarily Significant Unit	Major population group	Major spawning areas (MaSA)	Rivers/Reaches
Snake River fall Chinook Salmon	Lower Snake River	Upper Hells Canyon MaSA	Lower Salmon River
Snake River fall Chinook Salmon	Lower Snake River	Lower Hells Canyon MaSA	Snake River mainstem
Snake River fall Chinook Salmon	Lower Snake River	Lower Clearwater River MaSA	Clearwater mainstem
Snake River fall Chinook Salmon	Lower Snake River	Clearwater River MaSA	Clearwater mainstem

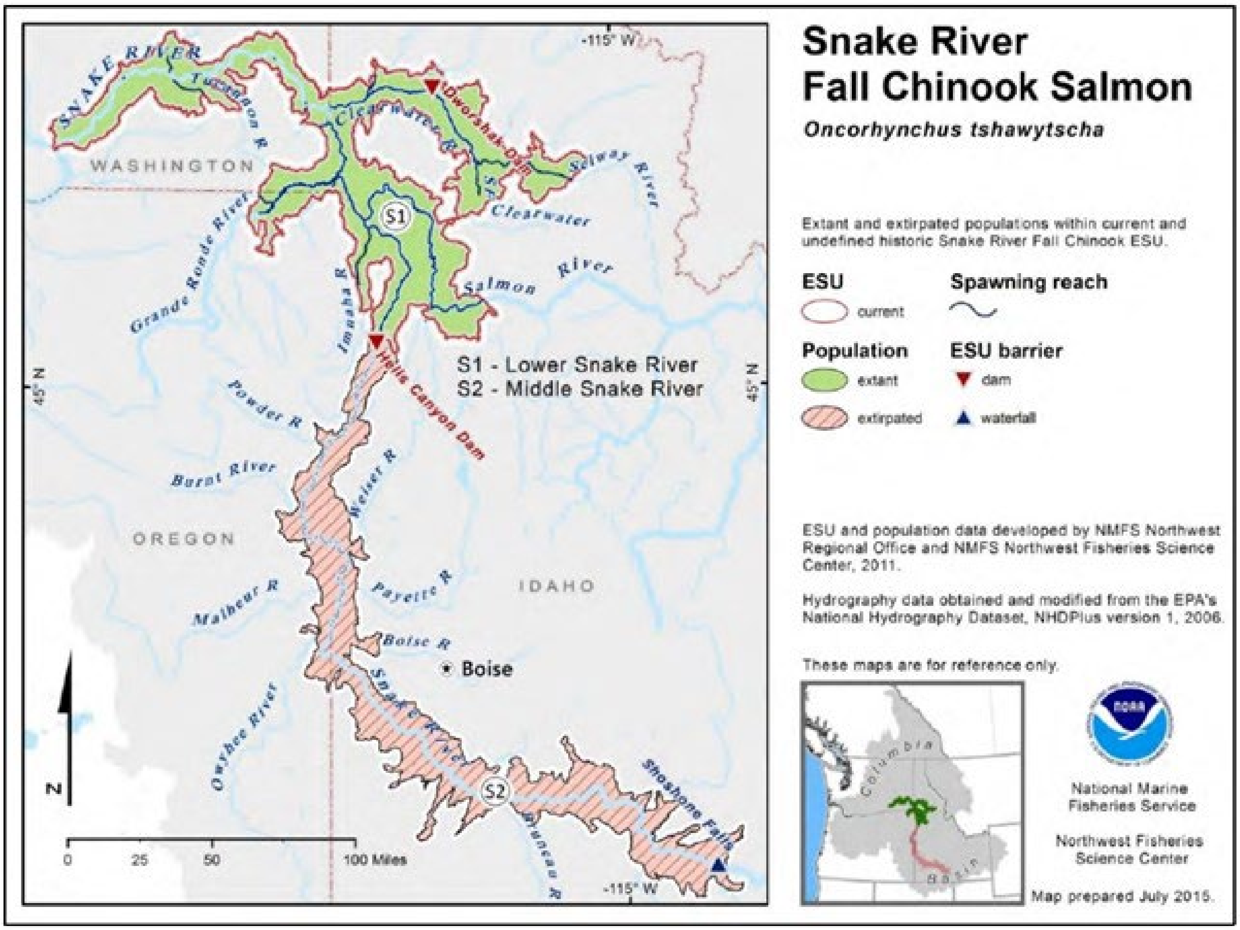

Figure 10. Snake River Fall chinook salmon migrate and spawn primarily in the mainstem Snake River and Clearwater rivers downstream of the Forest.

Critical Habitat for Snake River fall Chinook Salmon was designated December 28, 1993 (58 FR 68543). Critical Habitat includes all Columbia River estuarine areas, the Columbia and Snake rivers, all Snake River reaches upstream to Hells Canyon Dam, the Palouse River up to Palouse Falls, the Clearwater River from its confluence with the Snake River upstream to its confluence with Lolo Creek, and the North Fork Clearwater River from its confluence with the Clearwater River upstream to Dworshak Dam, and the Lower Salmon subbasin. All HUC8 subbasins managed by the Forests except for the Upper and Lower

North Fork Clearwater are Essential Fish Habitat (EFH) for Chinook Salmon under the Magnuson-Stevens Act (1976, as amended).

Overall, the status of Snake River fall-run Chinook salmon has clearly improved compared to the time of listing according to the 2022 biological viability assessment (Ford 2022). The single population in the ESU is currently meeting the criteria for an overall risk rating of 'viable', but the ESU as a whole is not meeting the recovery goals described in the recovery plan for the species which requires the single population to be rated as 'highly viable with high certainty' or will require reintroduction of a viable population above the Hells Canyon Dam. The Snake River fall-run chinook salmon ESU therefore is considered to be at a moderate-to-low risk of extinction, with viability largely unchanged from the prior review (National Oceanic and Atmospheric Administration 2022b).

Snake River Sockeye Salmon and Critical Habitat

The Snake River Sockeye Salmon ESU was listed as an endangered species under the Endangered Species Act on November 20, 1991 (56 FR 58619). The listing was reaffirmed on June 28, 2005 (70 FR 37159) and July 26, 2022 (National Oceanic and Atmospheric Administration 2022b). The ESU includes all naturally spawned anadromous and residual sockeye salmon originating from the Snake River basin. Also, the ESU includes sockeye salmon from the Redfish Lake Captive Broodstock Program, and the Snake River Sockeye Salmon Hatchery Program (70 FR 37159; 85 FR 81822). The species remains at risk of extinction.

Critical habitat for Snake River Sockeye Salmon was designated on December 28, 1993 (58 FR 68543). It includes the juvenile and adult migration corridor to the Pacific Ocean: the Columbia River and its estuary, the Snake River, and the main fork of the Salmon River up to the Sawtooth Valley and the site of current spawning, Redfish Lake. Other historical nursery areas that are essential to the conservation of the species and identified as critical habitat include Alturas, Pettit, Stanley, and Yellowbelly Lakes and their inlet and outlet creeks, Alturas Lake Creek, and that portion of Valley Creek between Stanley Lake Creek and the Salmon River (U.S. Department of Commerce 1993). Much of this area is contained within the Payette National Forest. Snake River Sockeye Salmon do not have designated EFH.

Snake River Sockeye Salmon migrate from the ocean, up the Salmon River, passing through the Forests on their way to natal, lacustrine habitats to spawn. There is no spawning or rearing habitat on the Forests. Effects to mainstem habitats including those used by Sockeye will be discussed as they relate to the other species addressed in this report.

In terms of natural production, the Snake River sockeye salmon ESU remains at "extremely high risk," although there has been substantial progress on the first phase of the proposed recovery approach to develop a hatchery-based program to amplify and conserve the stock to facilitate reintroductions. Current climate change modeling supports the "extremely high risk" rating with the potential for extirpation in the near future (Crozier et al. 2020). The viability of the Snake River sockeye salmon ESU therefore has likely declined since the time of the prior review, and the extinction risk category remains "high" (National Oceanic and Atmospheric Administration 2022b).

Coho Salmon and Essential Fish Habitat

Coho salmon were historically present in the Clearwater basin but were officially declared extirpated in 1985 (Galbreath et al. 2014). Coho have been reintroduced in some drainages on the Forest, but hatchery/reintroduced Coho are not listed under the Endangered Species Act. Historic and current Coho habitat in the Clearwater, Middle Fork Clearwater, South Fork of the Clearwater, and the Lower and Upper Selway HUC8s are Essential Fish Habitat for Coho Salmon under the Magnuson-Stevens Act

(1976, as amended). Adult Coho are spawned at Kooskia National Fish Hatchery, and incubated, and reared at Dworshak National Fish Hatchery (Idaho), Kooskia National Fish Hatchery (Idaho), and Eagle Creek National Fish Hatchery (Oregon) and are released into Clear Creek and Lapwai Creek downstream of the Forest boundary. Coho is a subset of EFH for Chinook such that the proposed action could affect them in a similar way; Coho are therefore not discussed specifically in this biological assessment.

Environmental Baseline

Factors Affecting Baselines

Infrastructure

Roads and trails have been studied and found to introduce sediment into streams. In the mountains of Central Idaho, roads interacting with granitic slopes has been a focus of researchers for more than 25 years (Ketcheson and Megahan 1996). Forest roads are the second largest source of sediment in rivers in the northwest, following wildfire (Elliot 2013). Existing roads in riparian areas can displace or remove riparian vegetation that provides shade, allochthonous inputs, and wood which help keep stream habitat cool and ecologically and structurally complex. Roads that are closer to stream channels have a greater potential for sediment delivery to streams (Wemple et al. 1996, Pechenick et al. 2014).

Channel confinement due to road prisms in floodplains can cause scour and where hardened by riprap, can both increase bankfull velocities during high flows and remove naturally occurring velocity refugia. Large wood is often removed from stream channels near roads to defend infrastructure such as bridges. Streams that are close to roads typically have lower large woody debris counts (Meredith et al. 2014). Culverts can constrain or block aquatic organism passage; cross drains on roads are often some of the largest sediment producers (Ketcheson and Megahan 1996, Coe 2006).

Bull trout rely on coarse substrates throughout all their life stages (Rieman and McIntyre 1993), and deposited sediment increases the degree of embeddedness and lowers mean particle size. Consequently, “any increase in the proportion of fines in substrates should be considered a risk to productivity of an environment and to the persistence of associated bull trout populations” (Rieman and McIntyre 1993). Ground disturbance from road construction, maintenance, and use can increase sediment production until the disturbed area can re-stabilize (Ketcheson and Megahan 1996, Luce and Black 1999). Not all road segments are equal; roads that have more stream crossings and cross drain structures have greater connection to the stream network and are more likely to deliver a large percentage of sediment that reaches the stream. Furthermore, roads often have hotspots that are responsible for a significant amount of sediment delivery (Cissel et al. 2014). A study in Northwestern Montana found only 2 percent of a road network was responsible for 90 percent of sediment delivery from roads. In addition to sediment caused by crossings, gully development, landslides, and road fill erosion can contribute to instream sediment loads (Al-Chokhachy et al. 2016). The use of existing roads, particularly rocked or natural surface roads can generate fine sediment which may be available to be transported to streams. Replacing culverts in fish bearing streams typically requires dewatering and rerouting of the channel while a new culvert is replaced. These activities require capture and removal of listed fish in the channel section being dewatered, which has an adverse effect on the individuals captured and relocated outside the work area.

In upland areas, roads or portions of roads can become extensions of the hydrologic network, capturing, concentrating, and routing water and sediment into streams. This pattern is generally related to elevated and chronic sediment production and can affect the magnitude of discharge in a stream during storms or other high flow events. In some areas, roads have interrupted the connectivity of headwater streams to lower reaches, disrupting sediment and wood material transport downstream. Sediment delivery to streams occurs primarily at road-stream crossings and secondarily by road-induced gullies (MacDonald and Coe 2008). Components of roads including culverts, ditches, and cut- and fill slopes, can fail from age and weathering or during storm events, precipitating mass wasting whereby very large volumes of soil and roadbed are transported to streams in pulses.

Effects from roads and trails prior to the passage of PACFISH/INFISH are well known. In addition to standards and guides that were implemented under these two conservation strategies and the many limits they placed on road construction and use, two other rules were subsequently passed limiting new construction of roads, and management of the existing road network respectively. The Roadless Rule of 2001 updated by the State of Idaho in 2008 greatly limited the extension of the road system into roadless areas. The Access and Travel Management Rule of 2005 had several parts intended to improve the management of the existing road network. It required forests to identify roads for public use and restricted off-road motor vehicle use, and it required the identification of a minimum road network. Since the passage of the conservation strategies, Idaho Roadless Rule, and the Access and Travel Management Rule, the effects of the existing road network continue to be lessened.

Vegetation Management

Prior to the passage of PACFISH/INFISH, timber harvest occurred over large areas in individual sub-watersheds and often removed trees down to the stream edge. Harvest methods could create skid trails that concentrated runoff and delivered sediment. Studies occurring during this era and afterword have identified the importance of large wood to stream function. Large wood adds complexity to stream habitats by creating pools. Large woody debris is an important driver of instream habitat quality and wood delivered from riparian areas is an important source (McDade et al. 1990). Studies have been completed to help identify where wood in streams comes from (McDade et al. 1990, Reeves et al. 2003). In addition to streamside delivery, disturbance combined with topography can deliver a significant percentage from outside riparian management zones, especially in steeper watersheds that are more dissected. Models have also been developed to help identify the likelihood of riparian trees being delivered to the stream channel (Welty et al. 2002, Benda and Miller 2003, Benda et al. 2003, Meleason et al. 2003, Benda et al. 2016). Models considering riparian delivery consider distance from the stream, median tree height, and the direction that trees fall. While RMZs often grow tall trees given advantageous growing conditions, the first site-potential tree height area around fish-bearing and other streams is typically responsible for most streamside wood delivery.

Harvesting or otherwise manipulating timber near streams can result in a loss of streamside shade which can increase stream temperatures. A study that modeled the effects of riparian reserves on stream temperature in Washington found that the first 10 m were most important in protecting stream temperature and buffers greater than 30 m did not appreciably lower stream temperatures (Sridhar et al. 2004). A study on headwater stream microclimate by (Anderson et al. 2007) found that the first 10 m had the most effect on microclimate above the stream and that temperatures in the streambed increased only when streamside vegetation closer than 50 ft was removed (Anderson and Poage 2014). If a no-harvest buffer of 150 feet is implemented, stream shade would be maintained, and stream temperature would not be affected. Timber harvest within the second site-potential tree height would only be permitted if a subsequent review found that it would maintain its riparian and aquatic "function," to include the maintenance of stream temperatures.

While there is much debate regarding relationships between flow increase and increasing sediment loads (Safeeq et al. 2020), there is general agreement that magnitude of streamflow changes can be related to, "… the type, intensity, and spatial extent of timber harvesting, with clearcutting representing the most extreme case" (Safeeq et al. 2020). Typically, excessive peak flows have been thought to negatively interact with land uses (Lyons and Beschta 1983) to destabilize the stream channel causing degradation of fish habitat by decreasing habitat diversity (loss of pools, cover, stable substrates) and increasing in-channel sediment production. Channel instability has been thought to occur when the scouring process leads to degradation (downcutting), or if excessive sediment deposition results in aggradation. Extensive timber harvest within a headwater catchment in a sub-watershed may alter patterns and volumes of stream discharge, snowpack dynamics, and how watershed-scale discharge reacts to rain-on-snow or other storm events. Safeeq et al. (2020) found that sediment increases were more related to sediment availability than increased flow. Although harvest that occurred next to streams historically contributed large amounts of sediment to streams both directly, from the riparian area harvested, and indirectly by allowing overland flow from surrounding areas, changes in forest practices such as the use of riparian buffers and other BMPs can minimize negative effects to streams from harvest associated sediment. Study results indicated that when vegetated buffers are in place, large increases in runoff caused only minor increases in sediment delivery to streams, indicating that vegetated buffers are highly effective at capturing overland flow (Safeeq et al. 2020). Another study found that riparian buffers of as little as 10 meters prevented most overland sediment from reaching streams Rashin et al. (2006). Improvement in effectiveness of BMP's has also resulted in reductions in sediment and nutrient delivery (Everest and Reeves 2007, Sugden et al. 2012). Examples include restricting skid trails near streams and preventing machinery from operating close to streams. A recent study in British Columbia failed to find broad-scale significant effects of a suite of habitat pressure indicators on abundance of spawning Chinook salmon (Peacock et al. 2023). The authors' unexpected results could be influenced in part by the adoption of modern forest management practices required by Provincial law such as the Forest and Range Practices Act of 2002, and associated BMPs (British Columbia Ministry of Water Land and Air Protection 2004).

Recent literature seems to be converging upon two points regarding the effects of vegetation disturbance on streamflow. First is that it requires approximately a 20 percent change in forest canopy to produce detectable changes in streamflow (MacDonald and Stednick 2003, Grant et al. 2008, Troendle et al. 2010). And second is that the way in which streamflow responds to vegetation disturbance is highly variable. For example, in their synthesis of 78 papers looking at vegetation disturbance effects on streamflow across western coniferous forests, Goeking and Tarboton (2020) reported that streamflow could increase, decrease, or stay the same based on a variety of factors. Furthermore, effects can also vary temporally as streamflow might initially increase following a stand-replacing event but then decrease after 20 years as evapotranspiration increases in the emerging understory (Goeking and Tarboton 2020). Regardless of the net direction streamflow goes in response to vegetation disturbance, it is worth considering that the magnitude of change is likely to be orders of magnitude smaller than streamflow responses to climate variability (Li et al. 2018).

Fire Management

The relation of fire behavior between riparian areas and adjacent uplands is influenced by a variety of factors, contributing to high spatial variation in fire effects to riparian areas. Landform features, including broad valley bottoms and headwalls, appear to act as fire refugia (Camp et al. 1997). Riparian areas experiencing moderate annual climate conditions can have higher humidity and can act as a buffer against fire and therefore as a refuge for fire-sensitive species (Halofsky and Hibbs 2008).

Biophysical processes within a riparian area, such as climate regime, vegetation composition, and fuel accumulation are often distinct from upland conditions (Dwire and Kauffman 2003, Reeves et al. 2016b). This can be especially true for understory conditions (Halofsky and Hibbs 2008). Fire-driven episodic contributions of large woody debris and coarse sediments generally result in beneficial long-term effects and provide a countervailing influence on near-term, acute negative effects (Benda et al. 1998).

Some studies have found fire typically occurs less frequently in riparian areas (Russell and Mcbride 2001, Dwire et al. 2016). Fire effects occurring upstream will likely influence downstream conditions (Wipfli et al. 2007), as well as future fire behavior (Pettit and Naiman 2007). Effects of high severity fire on aquatic systems will likely have short term negative affects at the reach scale but beneficial effects over time at that same scale as recolonization naturally occurs (Gresswell 1999).

Other studies have found that high severity wildfires in riparian areas can result in direct and indirect mortality of fish from deleterious increases in stream temperature while the fire is burning and debris torrents in the months following the fire. Under severe fire weather conditions and high fuel accumulation, riparian zones may become corridors for fire movement (Pettit and Naiman 2007). Long-term increases in stream temperature post-fire have been documented (Mahlum et al. 2011, Sestrich et al. 2011), in some cases persisting for years after the fire (Dunham et al. 2007, Mahlum et al. 2011). As described in Rieman et al. (1997), fire may spur changes in watershed processes, such as surface erosion and mass failure, that are generally negative for fish at a site scale. Such effects are however part of the natural disturbance regime in ecoregion.

Depending on geologic and topographic features, riparian conditions and response to fire vary (Halofsky and Hibbs 2008). A study in mixed severity conifer stands in the Sierra Nevada found that riparian and upland conditions are similar and consequently fire effects are similar (Van de Water and North 2010). At a watershed scale, fire effects for one life history phase can be negative, while in the same watershed, the fire effects will be beneficial for another life history phase (Flitcroft et al. 2016). Considering these varied conditions that occur from the stream edge to upslope and from river mouth to mountaintop, riparian response to fire is complex and heterogeneous and therefore requires considerate effort to design treatment plans that maximize benefits for both terrestrial and aquatic dependent species.

At the site scale, wildfire can affect instream habitat by consuming riparian vegetation and reducing shade and thus increasing temperatures, and sometimes increasing the hydrophobicity of soils, which can affect patterns and magnitude of discharge, destabilize streambanks, increase the likelihood of debris torrents, landslides, and erosion generally and subsequent sediment delivery to streams. Prior to PACFISH/INFISH, fire suppression could affect stream habitat by creating connected disturbed areas that could route exposed soils into streams. Gerhardt and Green (1991) documented changes in stream channels in the Lower Selway and increased surface fines in 1989 and 1990 following a 1988 fire, but by 1991 surface fines declined, indicating much of the fine sediment delivered after the fire had been moved downstream or sorted by large woody debris. Subsequent observations of the fire made in 2004 indicated little or no fine sediment deposition.

Dry forest treatments, while still controversial (Williams and Baker 2012), are broadly supported by current scientific literature (Hessburg et al. 2016) and have continued to gain acceptance from the public and greater use by managers. In the Northern Region of the Forest Service, restoring mixed severity fire regimes also remains controversial and complicated for numerous reasons such as the habitat needs of Endangered Species Act species like steelhead, bull trout, lynx, and grizzly bear. Therefore, treating riparian areas in mixed severity forests can be especially controversial and complicated. In locations where up-slopes and riparian forests have qualitatively similar fire effects, treatments guided by scientific findings are likely to restore ecological function of fire regimes at the landscape level (Finney 2007). Stream habitats created and sustained by fire are often more productive than similar habitats where fire was suppressed (Reeves et al. 1995, Benda and Miller 2003, Dunham et al. 2003, Rieman et al. 2003). In the Upper Selway on the Bitterroot National Forest, Jakober (2002) found increased- large woody debris, numbers of pools, residual pool volume, habitat complexity, and no evidence of long-term sedimentation of fish habitat as a result of fire. Position in the landscape relative to elevation, location within the stream network, and climate regime should be carefully considered to ensure understanding of riparian function (Pettit and Naiman 2007, Reeves et al. 2016a, Reeves et al. 2016b). Because the effects of restoration treatments on departed riparian habitats are poorly understood, focused research in an adaptive management framework will be necessary.

Mining

Historically, there have been hundreds of locatable mineral mining operations across the Nez Perce-Clearwater on both patented and unpatented mining claims. Impacts from historic mining are still evident across the Nez Perce-Clearwater. Placer and, to a lesser extent, lode mining have physically altered stream morphologies in much of the Palouse, Clearwater, Upper and Lower North Fork Clearwater, and South Fork River subbasins. Effects from historic mining was one of the leading causes for impairment to streams when the Nez Perce-Clearwater evaluated watershed conditions in 2011 using the Watershed Condition Framework (U.S. Department of Agriculture 2011a). All seven of the subwatersheds rated as Class 3 - impaired function included channel alteration and reduced water quality due to historic mining.

Recreational mining activities, such as panning, metal detecting, hand-sample collection, and the use of sluice systems, occur across the Nez Perce-Clearwater, particularly in areas of historic lode or placer mining activities.

The Forest Service is required to make minerals from National Forest System lands available while minimizing the adverse impacts of mining activities on other resources. Mineral exploration and mining activity on the Nez Perce-Clearwater falls into three federally recognized legal and regulatory mineral categories: locatable minerals, mineral materials, and leasable minerals. Locatable minerals are those that may be "located" with a mining claim under the General Mining Law of 1872, as amended. There are four types of claims: lode, placer, mill site, and tunnel. Locatable minerals include, but are not limited to, gold, silver, copper, lead, zinc, platinum, precious gems, uranium, bentonite, and chemical grade limestone. Locatable minerals are likely the most relevant to this BA as commonly used means (e.g., placer or suction dredge) are deployed in streams and streambanks, and their degree of management by the forests is statutorily limited. Mineral materials are common varieties of gravel, sand, stone, pumice, pumicite, common clay, and cinders. Leasable minerals are energy minerals such as oil, gas and coal, and other mineral commodities such as phosphate, potassium, sodium, gilsonite, oil shale, and sulphur, to include geothermal resources. However, revised plan components designed to guide management of mineral activity in a way that is compatible with aquatic/riparian resources (AREM) do not distinguish between the three categories and use the term 'mineral' generically to provide protections from all three.

Table 28 summarizes recent locatable mineral administration on the forests. Prospective miners submit notices of intent (NOIs) to the forests expressing their intentions to mine on the forests. Plans of operations (POOs) are required when the forests determine that proposed mining would cause a significant disturbance to surface resources. Of the 145 NOIs received between 2014 and 2019, 74 percent required that POOs be submitted. Between 2014 and 2019, 79 percent of POOs were approved by the forests, nearly all involving surface disturbances of less than 5 acres. The Forests approved 64 suction dredging plans under a record of decision in 2010 for Lolo and Moose Creeks[1], and under a decision notice for French and Orogrande Creeks and the South Fork Clearwater River in 2016[2]. Of the 85 approved POOs between 2014 and 2019, 75 percent were expected to adversely affect listed species or

[1] Small-Scale Suction Dredging in Lolo Creek and Moose Creek: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd537381.pdf

[2] Small-scale Placer Mining Project: https://www.fs.usda.gov/project/nezperceclearwater/?project=46844

critical habitat. In the most recent period, 21 Notices of Non-Compliance (NONCs) were issued, though only to two particular operators, which would imply that the majority of operators follow the terms of their POOs.

Table 28. Summary of locatable mineral administration on the Forests, 2004-2019. Note that plan of operations commonly are authorized for multiple years so that some plans span reporting periods causing number of plans by acreage or NEPA analysis to correctly sum to the total approved in that period.

Events	FY 2004-2008	FY 2009-2013	FY 2014-2019
Notice of Intent (NOI)	n/a	n/a	145
NOIs requiring Plans of Operations (POOs)	59	81	108
POOs that got approval	38	26	85
Approved plans of operations < 5 acres	40	23	77
Approved plans of operations 6 - 50 acres	0	1	0
Approved plans of operations > 50 acres	0	0	0
Plans of operations, Categorical Exclusion	27	19	14
Plans of operations, Environmental Analysis	5	1	2
Plans of operations, Env. Impact Statement	0	8	64
Effects to TES/Critical Habitat?	5	7	64
Notice of Non-Compliance (NONC)	6	10	21
Number of Operators with NONCs	2	2	2

Approved POOs included suction dredging, lode and tunnel exploration and development, placer exploration, road building, drilling, high-banking, and general location, and exploration. Observed impacts caused by these activities included sediment run-off (presumably into streams, but not necessarily), compacted soils, riling, overland flow, and impacts to riparian habitat. Mitigation required by the forests included scarifying compacted soils to led to better vegetation recruitment and fewer weeds. State of Idaho and Forest Service best management practices provided largely successful and non-burdensome mitigation measures. Despite mitigation measures, there were access roads used by miners that were not sufficiently water barred that contributed to erosion and in some locations, there were persistent weeds or vegetation didn't naturally recruit in compacted soils. Importantly, forest personnel monitored mining locations and noted that "no significant impacts… to fish… were noticeable" because of suction dredging and placer mining.

Mining of the stream channel directly causes stream- bed and bank instability and sediment- production, mobilization, and eventually deposition. Placer mining operations create disturbed areas large enough to gather streambed material, sort, and deposit it. Water can be consumed or contaminated, soil disturbed, and persistent man-made or naturally occurring chemicals/elements can be made biologically accessible to organisms. Loss of riparian vegetation through mining activities can influence the amount of solar radiation and thus water temperatures. Access roads and staging areas near streams can create compacted and connected disturbed areas that produce and route sediment into streams.

Requests for approval of small lode and placer mining operations may occur but it is not possible to predict how many may be submitted in any given year or how many may be approved. Since Congress has imposed a moratorium on the patenting of mining claims, there would be no change in the acres of patented lands unless Congress lifts the moratorium. In 2019 for example, the Nez Perce-Clearwater had approximately five approved POOs for small lode and placer mining and one approved exploration activity investigating larger deposits. Annually, the Nez Perce-Clearwater expects to administer 40 to 50

POOs for suction dredging and receives 20 to 30 NOIs. NOIs generally propose small-scale mineral exploration activities that range from mineral prospecting with hand tools to small-scale placer operations. Currently, there are no large or medium sized mines operating on the Nez Perce-Clearwater. However, because of new technology in mineral exploration and mining techniques, mineral deposits once considered below grade could become in demand and the likelihood of mineral development could then increase.

Livestock Grazing

Livestock grazing in the west is controversial, with some recommending the practice should be removed or greatly curtailed on public land with the approaching effects of climate change (Beschta et al. 2013), while others suggest grazing is an essential tool to help reduce fine fuels on western Rangelands (Svejar et al. 2014). As a part of its mandate to provide goods and services and at the same time protect ecological processes, the Forest Service continually works to balance these seemingly incompatible viewpoints. Livestock grazing, even in riparian areas, can sustain natural resources if management enables control and variation in its duration and timing, spatial distribution, intensity of use, and allows for periods of recovery (Swanson et al. 2015).

Perennial vegetation on or near the water's edge (greenline) on low gradient streams encounters the most erosional stress during floods. Flooding is a natural disturbance process that maintains heterogeneity in riparian and in-stream structure, function, and composition (Naiman and Decamps 1997). The natural disturbance regime effects of flooding can be compounded by various land-use practices resulting in decreased riparian function. Riparian vegetation has the best opportunity to slow velocity and induce deposition of materials, stabilize banks, and re-create channel pattern, profile, and dimension appropriate for the landscape setting. Where streambank instability or changes in channel form may arise from channel widening or channel incision, vegetation along the greenline is most critical. This is particularly important for alluvial, or "self-forming" channels (Leopold et al. 1964). Depending on site potential, greenline, riparian, and floodplain plant communities also contribute wood and aid floodplain energy dissipation, sediment and nutrient sequestration, and aquifer recharge (Swanson et al. 2015).

A publication discussing grazing in southwest Montana disclosed some of the history of grazing and focused attention on the stream channel response and management options (Bengeyfield 2006). Extensive grazing by both wild and domestic ungulates can remove woody plants (Batchelor et al. 2015), reduce the vigor of perennial forbs and graminoids (grasses), and cause channel profile and function changes via bank collapse on low gradient streams (Trimble and Mendel 1995, Bengeyfield 2006). Widening of channels, increased stream temperature, increased fine sediment, altered bank structure and/or loss of overhanging vegetation that may occur from excessive grazing (Myers and Swanson 1996, Kershner et al. 2004a) are often harmful to aquatic fauna, especially cold-water dependent species (Belsky et al. 1999, Saunders and Fausch 2007). Furthermore, some studies have demonstrated trout respond positively to livestock exclusion (Sievers et al. 2017), though mechanisms are not clearly understood.

Funding available to national forests to monitor grazing implementation can be limited while methods available to monitor are varied and being improved (Kershner et al. 2004b, Henderson et al. 2005, Bryant et al. 2006, Coles-Ritchie et al. 2007, Al-Chokhachy 2010, Burton et al. 2011, Hough-Snee 2013, Batchelor et al. 2015, Laine et al. 2015). While no one method works everywhere, stubble height has been extensively studied, and is widely put in practice as a trigger for cattle movement or an end of season monitoring indicator (Clary and Webster 1990, Clary and Leininger 2000).

Riparian stubble height measurements within Nez Perce-Clearwater grazing allotments are conducted by range specialists periodically during the grazing season. Most of the data is collected along streams with less than 4 percent gradient. Table 29 displays the existing riparian stubble height objectives as documented in Annual Operating Instructions and the range of measured riparian stubble heights and the end of growing season within pastures for years 2015 to 2020. Because measurements are taken at different locations within the pastures it is difficult to establish trend.

Table 29. Annual Operating Instruction (AOI) riparian stubble height objectives for active allotments on the Nez Perce-Clearwater and range of stubble heights* for pastures within allotments by monitoring year

Allotment Name	AOI Stubble Height Objective (inches) or Percent Utilization	2015 (inches)	2016 (inches)	2017 (inches)	2018 (inches)	2019 (inches)	2020 (inches)
Buckner	4.5	no data	no data	12-14	no data	no data	4-7
Cedar	4.5	no data	3-12	no data	no data	7	2-5
Dan Lee Meadows	4.5	no data	no data	10.5	17	7	13
Musselshell	4.5	24	4-12	12-15	11.6-20	12-16	8.4-10
Yakus-Pete King	4.5	no data	8-12	25-30	no data	7	7
Corral Hill	6	12	5-6	5-10	18.4	no data	10-12
Tahoe - Clear Creek	6	no data	no data	10-35	7.8	8	6-10
Camas-Jerome Creek	4	10.45	7.39	4.9	9.83	15.38	10.5
Corral Creek	4.5	3.8-10	5.5-9.4	3.3-10.1	4.6-9.8	7.4-13	14.3-15
East Fork Bear Creek	4.5	8.8	7.3	12.3	9.2	10.59	17.5
East Fork Corral Creek	4.5	10	8.64	10.06	8.08		15.25
Gold Creek	4.5	12.7	8.18	6.43	10.73	8.58	No data
Mount Margaret	4.5	12.8	7.9	7.9	12.7	8.17	15.5
Potlatch Creek	4.5	3-6	6.8-12	4.9-21	5.4-9.7	6.3-19	11.5
Purdue Creek	4.5	16.0	15.8	1.7	2.2	3.61	14.5
Round Meadows	4.5	10.1	12.6	13.3	15.3	23.26	21.0
Upper Palouse	4.5	No data	No data	No data	No data	No data	No data
West Fork Potlatch - Moose Creek	4.5	No data	No data	No data	No data	6.2-16.8	14.5-22.5
American River	6	11	no data	20-30	no data	no data	6-14
Elk Summit	6	non-use	non-use	non-use	vacant	vacant	6-8
Allison-Berg	65 percent	18	8-12	6-22	10	7.2-24	8-18
Butte Gospel	4	6	3-8	6-10	6-12	8.5-9	7-11
Cannon Ball	4	3-15	3	16-24	no data	13	2-10
Christie Creek	6 for bluebunch wheatgrass, 3 for Idaho fescue	4-8	3-8	6-13	3.7-10	2-20	4-11
Cow Creek	4	2-6	2-4	2-15	6.6-6.7	2-14.4	4-10
Earthquake	6	14	no data	non-use	6.7-16	no data	3-16
Fiddle Creek	6	10	3-12	3-12	no data	3.3	8-9
Hanover Mountain	4	2-4	3-10	non-use	4.6	no data	12
Hungry Ridge	6	18	2-3	4-36	6.3-24	6-8	6-12

Allotment Name	AOI Stubble Height Objective (inches) or Percent Utilization	2015 (inches)	2016 (inches)	2017 (inches)	2018 (inches)	2019 (inches)	2020 (inches)
Meadow-Lightning	4	4-12	3-12	6-28	6.7-12	4-10	4-12
Papoose	65 percent	6	4-10	4-7.6	no data	4-14.5	7-10
Peter Ready	65 percent	2-3	3-5	5-18	3.7-7.9	3.5-7	4-7
Race Creek	4	no data	6-18	6-12	6.8	no data	no data
Riverview	6	18	4-6	no data	4.3	no data	no data
Sherwin Creek	6 for bluebunch wheatgrass, 3 for Idaho fescue	no data	2-12	2-12	5.9	9.4-24	9-11
White Bird Creek	6	4-11	1-9	3-18	4.8-14	3.8-11	3-11

*Height or percent utilization of all herbaceous vegetation remaining along the greenline or floodplain at the end of the growing season

Livestock grazing has the potential to affect habitat by trailing along streambanks and grazing and trampling riparian vegetation (Platt 1991, Gregory and Gamett 2009). These impacts may reduce the function of PBFs 1-4 and 8 by increasing bank instability, creating erosion, and increasing fine sediment input. Reduction of riparian vegetation through consumption or physical impacts from trampling can also affect the function of PBFs 1, 2 and 5 by removing near-stream and overhanging vegetation. Near-stream and overhanging vegetation provides cover, complex habitat, shade that maintains cool water temperatures, introduces nutrients in aquatic habitats via litter fall, and thus supports the development of complex habitat and an abundant food base for aquatic ecosystems. It is likely that at some locations within or near Critical Habitat, grazing impacts have slowed willow recovery (Andrew et al. 2004) and reduced terrestrial inputs (Saunders and Fausch 2007).

The PACFISH/INISH Biological Opinion (PIBO) Monitoring Program has completed status and trend reports on stream habitat conditions for sites on the Nez Perce-Clearwater (Saunders et al. 2020). One of these PIBO attributes is bank stability and the attribute most applicable to livestock grazing. Bank stability is the percent of stream bank covered with plants or rock. As shown in table 30, bank stability across the Nez Perce-Clearwater is not showing a significant trend. There are nine subbasins containing Nez Perce-Clearwater livestock grazing allotments. The Palouse, Middle Fork Clearwater, Middle Salmon-Chamberlain, and Little Salmon subbasins do not have enough managed PIBO sites to establish trend. Out of all the subbasins that have grazing allotments, only the Clearwater subbasin shows a trend in bank stability away from reference conditions. Livestock grazing allotments in the Clearwater subbasin include Dan Lee Meadows, Musselshell, Cedar, Buckner, and Yakus-Pete King.

Table 30. Trend in bank stability stream habitat attribute (PIBO Metric VegStab) at the Forest scale and for Subbasins containing livestock grazing allotments.

Scale	Time 1*	Time 2*	P-Value*	Sample Size*	Trend*
Nez Perce-Clearwater Forest Scale	84.21	85.33	0.48	67	Not Statistically Significant
Clearwater Subbasin	93.21	75.68	<0.01	11	Away
Lochsa Subbasin	84.31	83.98	0.86	12	Not Statistically Significant
South Fork Clearwater Subbasin	93.26	94.02	0.89	8	Not Statistically Significant
Lower Salmon Subbasin	76.01	87.22	0.17	6	Not Statistically Significant
Lower Selway	88.1	94.42	0.69	5	Not Statistically Significant

*Time1 = mean during first visit; Time2 = mean value for last visit; -Value = P-value (PIBO considers a result significant if p<0.1); Sample size = number of observations with repeat visits; Trend or Actual Change = actual direction of change in the mean, which can be not statistically significant, toward, or away from reference conditions

Data Source: Stream Habitat Condition for Sites in the Nez Perce-Clearwater National Forest (Saunders et al. 2020)

Grazing allotments can occur in grasslands and meadows or in transitory range. Transitory range is created in forested areas that are harvested. In allotments that have been logged, particularly on steeper ground, cattle frequently utilize logging roads for trailing and to forage (Roath and Krueger 1982). Effects of grazing typically do not occur uniformly over the landscape as livestock preferentially utilize riparian areas and often avoid steep slopes (Roath and Krueger 1982, Gillen et al. 1984). In dry landscapes, “water was a primary factor in determining cattle use of an area…. [and was] the central point of distribution,” and the location of salt was relevant (Roath and Krueger 1982).

Low gradient streams are more sensitive to grazing than are steeper gradient streams. Streams with gradients less than 2 percent, and to a lesser extent, less than 4 percent, are the most sensitive to grazing impacts (Rosgen 1996) because their banks are unconfined by topography (Montgomery and Buffington 1997) and depend upon vegetation to secure streambanks. Riparian vegetation is an important factor in maintaining streambank stability in Rosgen C, E, and G channel types, especially since those channel types have a very high sensitivity to disturbance (Rosgen 1996). Rosgen C and E channel types have stream gradients less than 2 percent, while G channels have gradients ranging between 2 to 4 percent. Higher gradient streams (4 to 10 percent), often near or in headwaters, are confined by bedrock and colluvium (Rosgen 1994, Montgomery and Buffington 1997) and therefore are not as easily altered by cattle.

Recreation

Recreation can affect aquatic resources in a variety of ways. For example, developed and dispersed camping can concentrate use along waterways where riparian vegetation can be damaged, soil compacted or eroded, instream habitat manipulated (logs moved, rocks re-arranged, etc.), and contaminants introduced such as fuel, garbage, or human waste. Trail infrastructure can similarly affect riparian vegetation and soils at stream crossings and in RMZs.

Land and Special Uses

The lands and special use programs on the forests include forest-issued permits, term permits, leases, or easements, that allow occupancy, use, rights, or privileges on Forest Service lands. Authorizations would be granted for specific uses for specific periods of time. New permits could be issued for activities as broad as a variety of commercial uses including outfitters and guides, access to private lands, film permits, etc.

Watershed Restoration

Under the current forest plan, widespread improvements to instream habitat have been sought by decommissioning problematic or unnecessary roads and improving fish passage. These actions would still occur to some extent under the revised plan. Future direction focuses on further reducing baseline sediment related to the road network, reducing project-specific impacts, and restoring floodplain connectivity and natural channel-forming processes. This shift reflects BASI and the evolution of land management practices on federally managed lands.

Existing Conditions at the Forest Scale

This BA uses PIBO data to address stream conditions at the Forest Scale, and then at the subbasin scale when enough samples were available. The PACFISH/INFISH Biological Opinion (PIBO) effectiveness monitoring program evaluates the status of stream habitat on Federal lands within portions of the Interior Columbia River and Missouri River basins and documents changes or trend of stream habitat conditions. Sites are visited every five years and sites on the Forests have been surveyed at least three times since PIBO sampling began in 1999. PIBO sampling or equivalent will continue within the plan area. Figure 11 illustrates the locations of existing PIBO sites on the Forest. [3]The forests received a PIBO report for sites on the Forest in 2020 (Saunders et al. 2020). The 2020 report included data collected from 2001 until 2019, and represented the most recent data available at the time the report was requested. The 2020 report evaluated data from an average of 64 managed sites and 40 local reference sites (depending on the metric).

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[3] Note: Further sampling at contract sites is dependent on future funding.

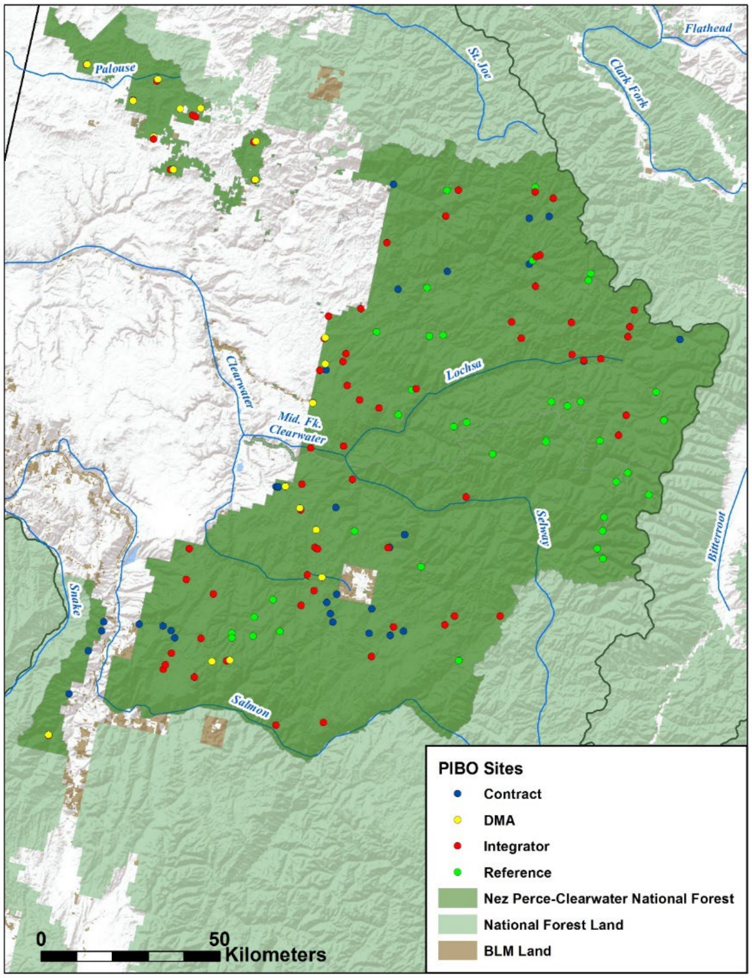


Figure 11. Locations of existing PIBO sites on the Forests

PIBO analyses assess the status of conditions and makes comparisons between reference and managed sites using a habitat index approach to determine if differences are statistically significant according to methods described in Al-Chokhachy et al. (2010). PIBO results are generalizable at several scales by design, including the Forest-scale. Typically, the smallest scale where comparisons can be made is the subbasin (HUC 4). The range of conditions exhibited by reference sites can be interpreted as the range of natural variability for streams and thereby provide benchmarks. If conditions at managed sites are outside of the range of those at reference sites, past management actions are considered to have had an effect (Archer and Ojala 2016).

A useful approach for assessing the status of stream habitat condition is to compare habitat characteristics to those of streams likely to be functioning properly (Stoddard et al. 2006). PIBO monitoring compares the status of stream habitat conditions at sites in ‘managed’ watersheds (watersheds exposed to disturbance from various management actions) to habitat conditions at sites within ‘reference,’ or relatively pristine, watersheds, which are used as a benchmark of expected condition. Because all streams are affected by natural disturbance, when assessing status of habitat conditions PIBO considers how the range of stream habitat conditions expressed at managed sites compares to what would be expected if the stream had experienced only natural disturbance. To ascertain the status of a given site, PIBO uses an index of habitat condition to help account for some for some natural variability among sites. A significant difference between the reference prediction and the actual managed site index scores can potentially be attributed to management. If the distribution of managed site conditions mimics the reference condition distribution, it can be assumed that managed sites fall within the range of natural variation. Conversely, if the distributions of reference and managed sites are different, then management may have had an effect on stream condition.

The overall index score from all managed sites across the Forest scored lower than that found at reference sites. (Table 31, figure 12, and figure 13). When considered at the forest level. residual pool depth and large wood frequency at managed sites both scored lower than ecoregional reference sites. Of the nine individual categories monitored for trends, three (OE, Large Wood Frequency, and D_{50}) showed a significant trend toward reference conditions, while the remaining six did not change significantly during the monitoring period. As described in the latest report (Saunders et al. 2020), overall, an average of 17 percent of managed sites showed statistically significant progress toward reference conditions in a habitat metric over repeated sampling, while none of the managed sites showed any significant movement away from reference conditions when considered at the forest-wide scale.

Table 31. Forest level stream attribute index status from streams across the Nez Perce Clearwater National Forest.

Metric	Data/Site Type	Index Score	P value	Significant Difference Between Managed and Reference?
Overall – All metrics combined	Managed	43.29	<0.01	Yes
	Reference EcoRegion	51.67		
Residual Pool Depth	Managed	4.32	<0.01	Yes
	Reference EcoRegion	5.48		
Pool Percent	Managed	4.45	0.09	Yes
	Reference EcoRegion	5.01		
Median Substrate (D50)	Managed	5.46	0.99	No
	Reference EcoRegion	5.47		
Pool Fines	Managed	4.74	0.09	Yes
	Reference EcoRegion	5.45		
Large Wood Frequency	Managed	5.71	<0.01	Yes
	Reference EcoRegion	6.67		
Bank Angle	Managed	5.43	0.73	No
	Reference EcoRegion	5.3		
Macroinvertebrate Assemblage	Managed	0.92	0.24	No
	Reference EcoRegion	0.95		

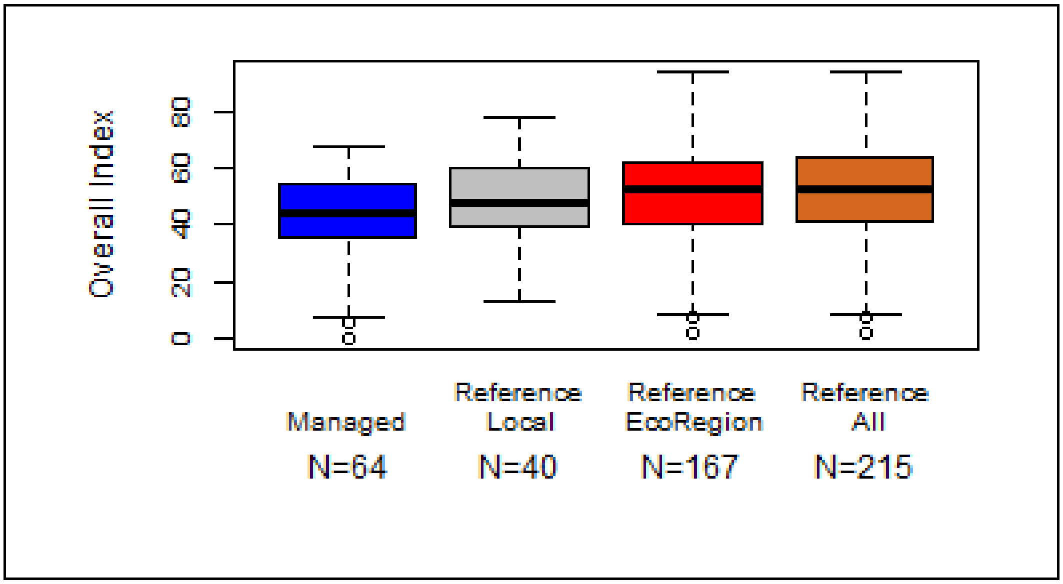
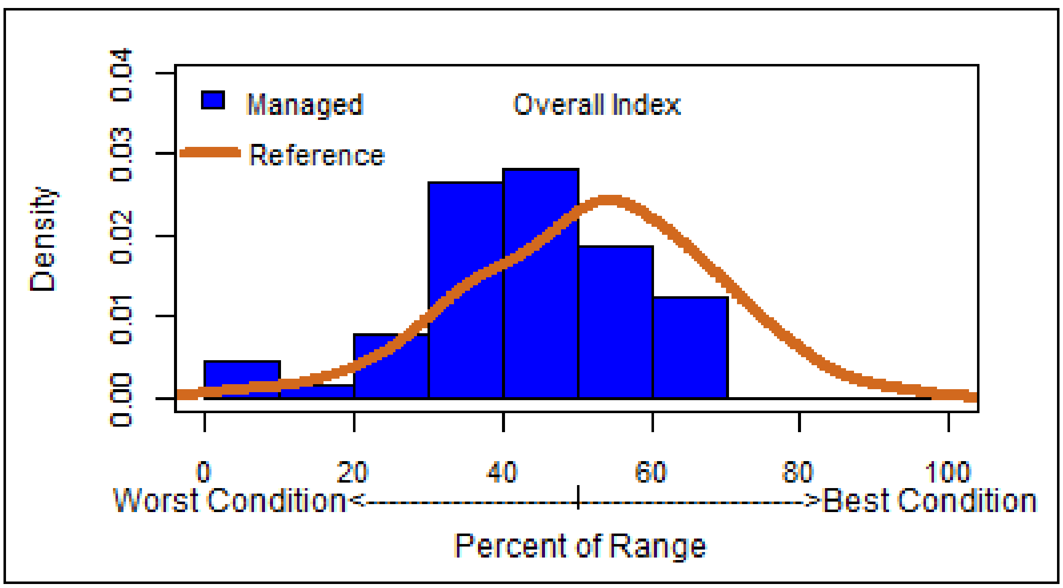


Figure 12. Overall index scores for 64 managed sites on the Forests, relative to reference scores (Saunders et al. 2020)



[4]**Figure 13. Overall Index values across the Nez Perce-Clearwater (Saunders et al. 2020)(Saunders et al., 2020)**

The data presented above indicates that overall stream conditions in 64 managed watersheds on the Nez Perce-Clearwater, when considered collectively, are outside the range of natural variability and in a less than desired condition. The data suggests that residual pool depth, pool percent, and large wood frequency are degraded and less favorable for salmonids when compared against reference subwatersheds. In addition, pool percent, median substrate size, pool fines, and macroinvertebrate assemblage in managed

[4] Note: Distribution of index values for managed reaches (histogram) compared to expected values at reference reaches (the line graph). Close matches between histogram height and line indicate conditions are similar at managed and reference reaches.

subwatersheds are not statistically different than reference and that pool fines and bank angle exhibit a more favorable conditions than in reference subwatersheds. It should be noted that the term “reference” should not be confused with “undisturbed.”

Trends in stream habitat attributes across the Nez Perce Clearwater are shown in Table 32. There were three attribute, including Observed/Expected macroinvertebrate score, large wood frequency, and median substrate size that have improved since the implementation of PIBO, and all other metrics have not significantly changed at the forest scale. Although the majority of metrics have not changed at this scale, none of the metrics have significantly degraded from 2001-2019. While some metrics remain below ecoregion reference benchmarks, the current Forest Plan as amended arrested further degradation, and in many cases allowed habitat conditions in streams to improve through passive restoration while allowing for forest management activities. In a 2018 Biological Opinion related to the effects of 26 Forest Plans on bull trout, including the current Plans for the Nez Perce-Clearwater National Forests, as amended, the U.S. Fish and Wildlife Service agreed that based on the results of the AREMP and PIBO monitoring programs, changes in grazing activities have resulted in improvements to stream habitat conditions [previously impaired by grazing]; and that those improvements were likely to continue, as current plans as amended have allowed for passive recovery of instream conditions (U.S. Department of the Interior 2018a).

Table 32. Trend in stream habitat attributes across the Nez Perce-Clearwater Subbasin including: Overall_Index score, O.E. (Observed/Expected macroinvertebrate score), VegStab (bank stability), UnCutPct (percent undercut banks), LWFrq (large wood frequency), Bank Angle, PTFines6 (percent fines in pool tails), D50 (median substrate size), RPD (residual pool depth), and PoolPct (percent pools). Time1 = mean during first visit; Time2 = mean value for last visit; Percent Change = Percent change in the mean values between the first and last visit; Sample size = number of observations with repeat visits; P-value = Significance test; Desired Direction = direction of change in the mean, which can be either + or -; Actual Change = actual direction of change in the mean, which can be not statistically significant (NS), + or -.

Metric	Time 1 Value	Time 2 Value	Percent Change	Sample Size	P-value	Desired Direction	Actual Direction
Overall_Index	40.52	42.47	4.8	65	0.228	+	NS
O.E.	0.87	0.91	4.6	66	0.033	+	+
VegStab	84.21	85.33	1.3	67	0.478	+	NS
UnCutPct	38.65	41.1	6.3	67	0.302	+	NS
LWFrq	279.34	318.07	13.9	67	0.038	+	+
BankAngle	100.61	103.54	2.9	67	0.112	-	NS
PTFines6	32.37	33.48	3.4	66	0.68	-	NS
D50	0.0398	0.0458	14.9	66	0.04	+	+
RPD	0.35	0.34	-2.9	67	0.428	+	NS
PoolPct	47.44	47.15	-0.06	67	0.864	+	NS

Properly functioning riparian and wetland systems are dynamic and more resilient to disturbances from natural and human-caused events than impaired systems. Based on the Nez Perce-Clearwater 2011 Watershed Condition Class assessment (USDA Forest Service, 2011[5]), 56 percent of the 220

[5] USDA Forest Service. 2011. Watershed Condition Class Assessment for the Nez Perce and Clearwater National Forests. Nez Perce-Clearwater Supervisor’s Office, Kamiah, Idaho can be found in the Project Record.

subwatersheds classified were rated as 'Functioning Properly.' Approximately 26 percent of subwatersheds were determined to be 'Functioning at Risk' and 18 percent of subwatersheds were rated as 'Impaired.'

The Forests have been steadily decreasing road mileage since 1999. About 1,783 miles of National Forest system and non-system roads have been decommissioned, about 19 percent of the known total, as shown in figure 14. Much of the decommissioning took place on legacy, non-system roads associated with former timber harvest. In addition to removing unneeded roads, some decommissioned roads were removed because they were located on unstable terrain or had failing drainage structures.

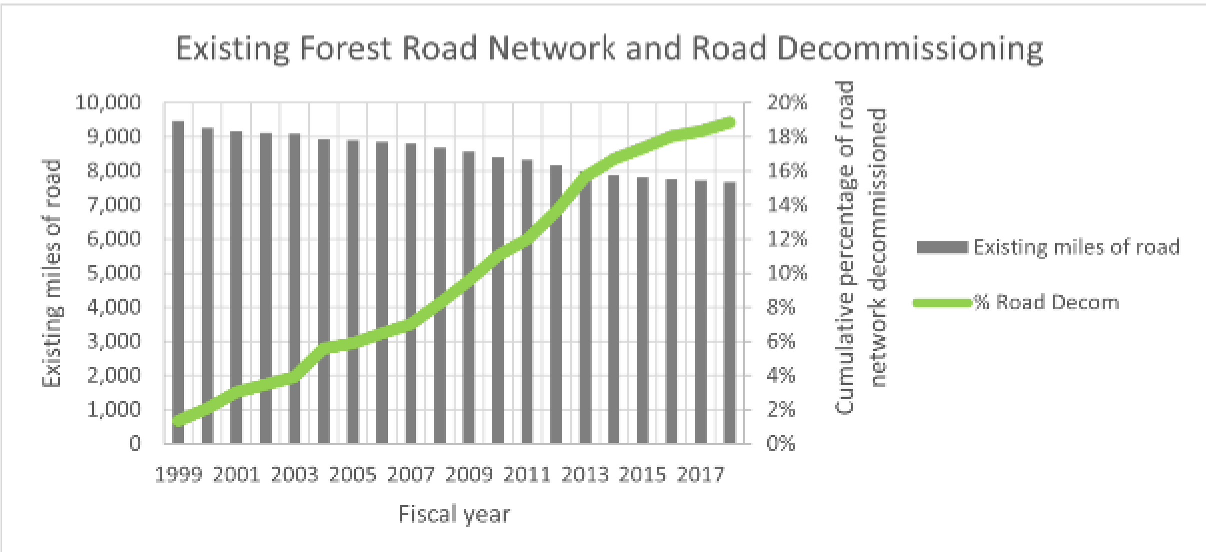


Figure 14. Existing forest road network and road decommissioning, 1999-2018

Existing Conditions at the Subbasin Scale

To further identify areas that need improvement, PIBO analyzes data at finer scales. PIBO data were summarized by subbasin when sample sizes were sufficient for statistical inference. The Forest includes portions of 11 subbasins (HUC8), including Palouse/Hangman, Lower North Fork Clearwater, Upper North Fork Clearwater, Lower Clearwater, Middle Fork Clearwater, South Fork Clearwater, Lochsa, Upper Selway, Lower Selway, Lower Salmon, Little Salmon, and Middle Salmon–Chamberlain. Of the 11 subbasins, 5 have enough sites to monitor for status at this scale, including the Lower Clearwater, Lower Salmon, Upper NF Clearwater, Lochsa, and SF Clearwater. One additional site (Lower Selway) does not have enough sites for status but does have enough to monitor trends. Because the Palouse subbasin isn't used by listed species and does not provide critical habitat, it is not discussed further in this document.

Clearwater Subbasin

Land ownership in this subbasin is highly mixed and comprised of private, state, federal, and tribal holdings. Potlatch Corporation and the Idaho Department of Lands manage substantial portions of the land base, and properties managed by these two entities are highly intermixed with those administered by the Forest. On the Forest, the three largest tributaries in the Clearwater River subbasin include the Potlatch River, Orofino Creek, and Lolo Creek.

Only 46 percent of the subbasin is managed by the USDA Forest Service. Road density is high, averaging over 4 mi/mi^2. Of the 11 subbasins in the proposed action area, the Clearwater is possibly the most departed from reference conditions. The mainstem Clearwater River provides spawning and rearing habitat for Snake River fall Chinook salmon. It serves as a migration corridor for steelhead trout and spring/summer Chinook salmon and provides overwintering habitat for both adult and juvenile salmon and steelhead. Westslope cutthroat trout, bull trout, and redband trout are present in the river as water temperatures allow. Cold water releases from Dworshak Reservoir in the mid-to-late summer may facilitate use of this section of river by these species while providing thermal refuge for returning adult fall chinook and steelhead trout in August and September.

PIBO data have been collected from 10 managed sites in the Clearwater subbasin and were last summarized in 2020 (Saunders et al.).When habitat indicators are combined to calculate the overall index value, managed sites scored lower than ecoregion reference sites (figure 15). Of the seven indicators used, four were not significantly different from reference sites, and three, pool fines, D_{50}, and OE score, scored lower than reference sites. All but one indicator had no significant trend, positive or negative. One indicator, streambank stability, showed a trend away from reference or desirable conditions.

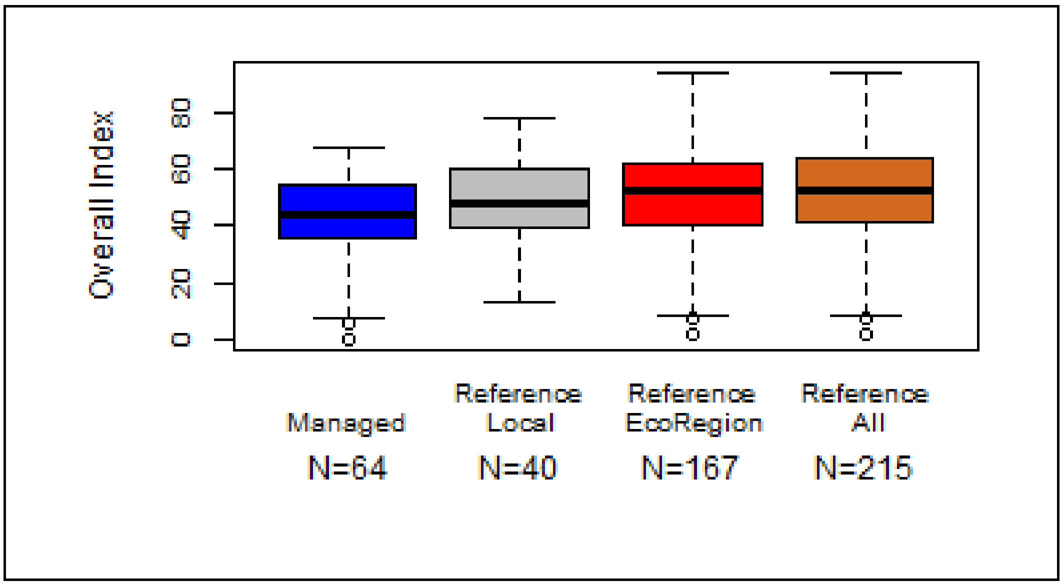


Figure 15. Overall index values in the Clearwater subbasin (Saunders et al. 2020). Median and range of index values for managed sites, reference sites within the ecoregion, and reference sites for the entire PIBO study area

Lower Salmon Subbasin

The Lower Salmon and Lower Little Salmon subbasins are intermixed with private, Bureau of Land Management, and State of Idaho lands. The Forests manage 57 percent of the acreage within these subbasins.

Specific reaches in many watersheds have been affected by past and ongoing livestock grazing and mining activities. Mining has resulted in substantial effects to riparian conditions in Upper Little Slate Creek. The Lower Salmon and Lower Little Salmon subbasins support most grazing on the Nez Perce-Clearwater. The Forests administer a relatively small portion of the lower Little Salmon subbasin, which mostly includes the Rapid River watershed. Some riparian reaches may be affected by streamside trails, dispersed camp sites, livestock grazing, and noxious weeds.

In the Lower Salmon and lower Little Salmon subbasins, 10 of the 22 subwatersheds have road densities greater than 3 mi/mi^2, a level associated with worsening instream conditions. PIBO assessed six managed sites in the Lower Salmon subbasin administered by the Forest, though only one site in the Little Salmon (Saunders et al. 2019). All the metrics except one showed no departure from reference conditions. Percent pools scored lower than reference conditions. Portions of this subbasin (Little Slate Creek drainage) have been heavily managed in the past, and Upper Little Slate Creek was also affected by mining. Cobble embeddedness was measured repeatedly under the former Forest Plan in the Slate Creek watershed and declined between 1988 – 1994 and 2011 – 2016 (U.S. Department of Agriculture 2019). Cobble embeddedness at the managed sites improved and came to resemble reference values. Of the nine metrics, most (five) showed no significant trend, while three (O.E., Large Wood Frequency, and D50) showed trends toward conditions observed at reference sites, and two (Uncut percent, Bank Angle) showed trends away from reference conditions.

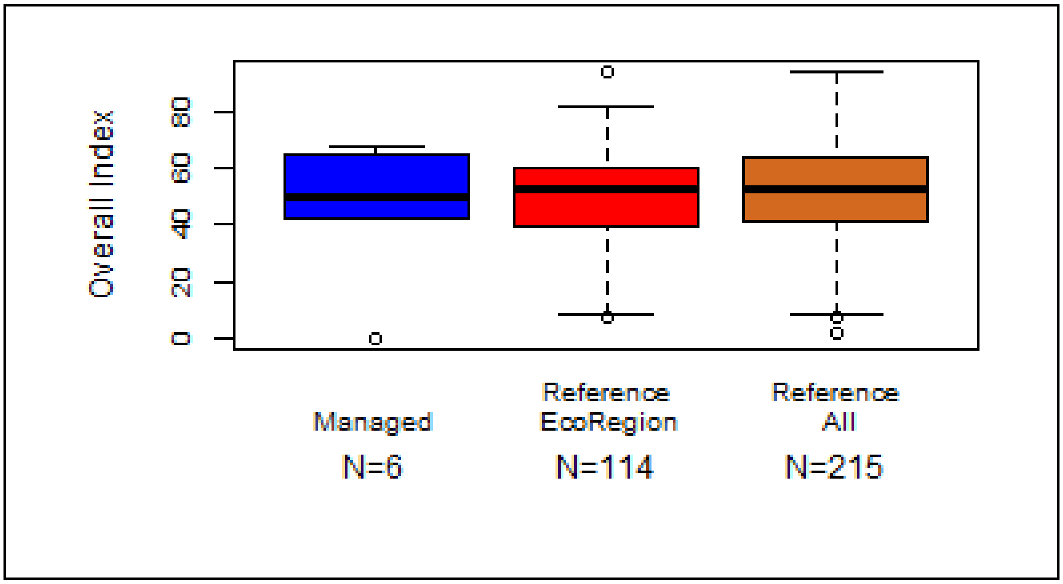


Figure 16. Overall index values in the Lower Salmon (Saunders et al., 2020). Median and range of index values for managed sites, reference sites within the ecoregion, and reference sites for the entire PIBO study area

Lower North Fork Clearwater Subbasin

Only 28 percent of the Lower North Fork Clearwater subbasin is managed by the Forests. Riparian areas throughout the mainstem North Fork Clearwater River and its tributaries were affected by wildfires in the early 1900s. Road construction and timber harvest activities have decreased the riparian cover along many tributaries throughout the watershed. Mining, agricultural and forestry activities have also changed the stream channel locations and morphology in some areas, particularly in watersheds with high percentages of mixed ownership, which includes nearly all of them. These changes have decreased the streamside shade, increased solar radiation to streams, increased sediment delivery, and generally decreased habitat complexity in streams. The construction of Dworshak Dam in the late 1960s resulted in the extirpation of anadromous fish from the basin.

Upper North Fork Clearwater Subbasin

The Upper North Fork Clearwater HUC8 subbasin extends from the mouth of Beaver Creek up to the headwaters. The Forests manage 93 percent of the subbasin. The Upper North Fork Clearwater was in the best overall condition on the Forests as summarized in the 2020 PIBO report (figure 17). Most of the habitat metrics scored higher than ecoregion reference benchmarks except for pool fines, bank angle, and D_{50} which scored lower than reference values. The overall trend was away from reference values, however the only individual metric that showed a significant trend was veg stability which moved toward reference conditions. The creation of Dworshak Reservoir has facilitated expression of multiple life history strategies in bull trout in the north fork Clearwater River, including resident and adfluvial population components.

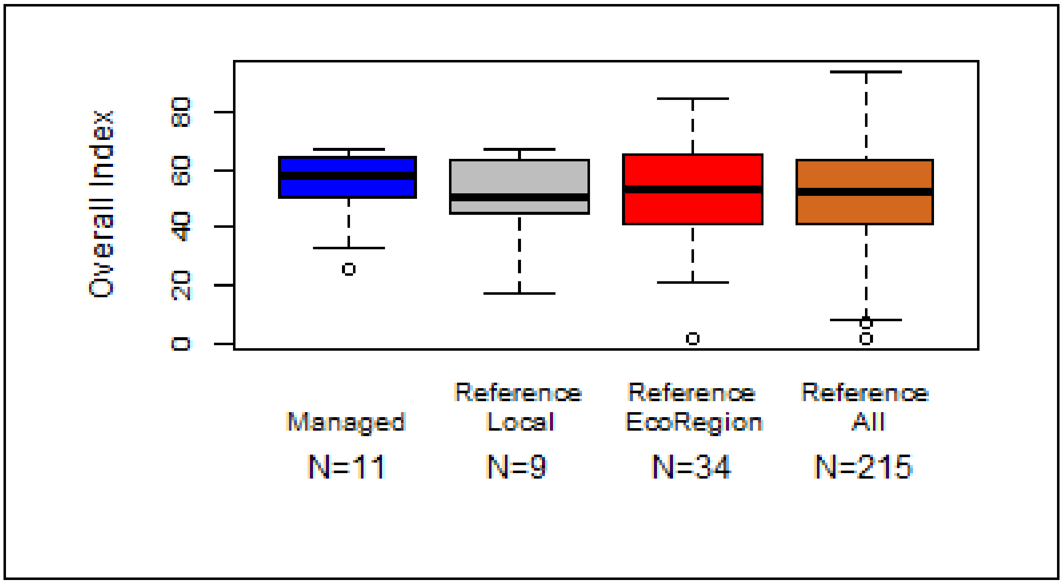


Figure 17. Overall index values in the Upper North Fork Clearwater (Saunders et al. 2020). Median and range of index values for managed sites, local reference sites, reference sites within the ecoregion, and reference sites for the entire PIBO study area

Lochsa Subbasin

The Lochsa River joins the Selway River to form the Middle Fork Clearwater at Lowell, Idaho. The subbasin contains large portions of undeveloped forest land with 96 percent of the land base administered by the Forests. Most of the Lochsa River is designated as a Wild and Scenic River and about half the subbasin, south of the river, is part of the Selway Bitterroot Wilderness Area.

Large fires occurred in the subbasin in 1910, 1919, 1924, and 1934 and may have occurred regularly before records were kept. Large fires have also occurred over the last 18 years, with many acres burning in 2000, 2007, and 2015. Some of these burned areas have not yet reforested and remain as brush fields. The combination of loose soils, steep slopes, and intense rain-on-snow events has produced landslides that dissect the subbasin with steep valleys and episodic delivery of sediment to streams. The subbasin landforms and the historic record confirm that these processes define the normal subbasin condition.

Road construction has created road densities of greater than 3 mi/mi^2 in 12 of 28 subwatersheds in this subbasin, likely reducing riparian cover and habitat quality. Larger streams in the Lochsa subbasin generally provide good to excellent spawning and rearing habitat.

Per the 2020 PIBO report (Saunders et al. 2020), the Lochsa was the second least disturbed subbasin summarized (figure 18). No metrics were significantly different than reference benchmarks, though residual pool depths trended away from reference values over the measurement period, and O.E. significantly trended toward reference values.

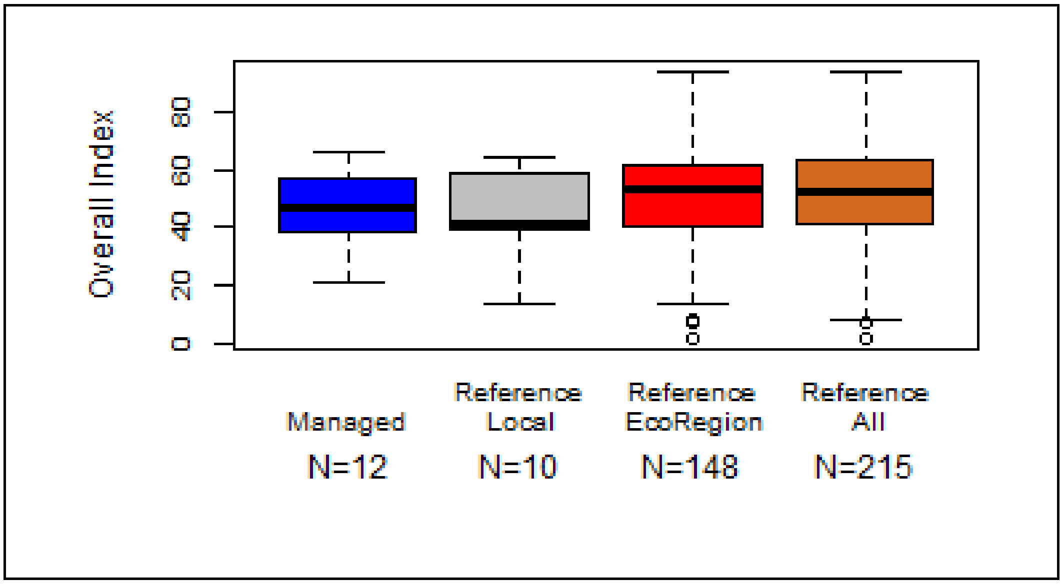


Figure 18. Overall index values in the Lochsa (Saunders et al. 2020). Median and range of index values for managed sites, local reference sites, reference sites within the ecoregion, and reference sites for the entire PIBO study area

The Forest's Watershed Condition Class assessment (USDA Forest Service, 2011[6]) noted that of 38 HUC12s in the Lochsa, 29 (76 percent) were Properly Functioning, while 9 were Functioning at Risk.

Selway River Subbasin

The Selway River extends from headwater areas administered by the Bitterroot National Forest to its confluence with the Lochsa River. Both the Upper and Lower Selway subbasins were priority watersheds under PACFISH/INFISH. Virtually all of the land in both subbasins are administered by the USDA Forest Service.

Compared to the rest of the subbasins on the Nez Perce-Clearwater National Forests, the two Selway subbasins are the least disturbed by human development. Only two of the 43 subwatersheds have road densities above 2 mi/mi^2 and only four have road densities above 1 mi/mi^2. Available data from streams above the wilderness boundary are assumed to represent natural conditions and indicated very low levels of deposited sediment, such as percent fines below 10 percent and cobble embeddedness below 25 percent; moderate to high levels of large wood depending on channel gradient; and moderate to high habitat complexity, as indicated by the number of pools, large wood, diverse substrate composition, and diverse channel gradients (USDA Forest Service unpublished data 1992 – 2003[7]). In 2011, the Forests Watershed Condition Class assessment (USDA Forest Service 2011[8]) noted that 42 out of 43 Selway HUC12s were Functioning Properly and 1 was Functioning at Risk. The Upper and Lower Selway subbasins do not have enough managed PIBO sites to establish status, but the Lower Selway does have enough to determine trends of stream habitat attributes (Saunders et al. 2020). The overall index trended

[6] USDA Forest Service. 2011. Watershed Condition Class Assessment for the Nez Perce and Clearwater National Forests. Nez Perce-Clearwater Supervisor's Office, Kamiah, Idaho can be found in the Project Record.
[7] USDA Forest Service. 2003. Stream Survey Data. Nez Perce-Clearwater Supervisor's Office, Kamiah, Idaho can be found in the Project Record.
[8] USDA Forest Service. 2011. Watershed Condition Class Assessment for the Nez Perce and Clearwater National Forests. Nez Perce-Clearwater Supervisor's Office, Kamiah, Idaho can be found in the Project Record.

toward reference conditions, as did the individual metrics D_{50} and large wood frequency. All other metrics showed no significant trends.

Middle Salmon-Chamberlain Subbasin

The Nez Perce-Clearwater National Forests share the administration of the subbasin with the Payette and Bitterroot National Forests. The Payette National Forest administers Forest Service lands on the south side of the Salmon River while the Nez Perce-Clearwater National Forests administer the north side. The Bitterroot National Forest administers a portion of the north side. There is little private land.

Specific reaches of some watersheds have been affected by past and ongoing livestock grazing and mining activities. A substantial portion of the Middle Salmon-Chamberlain subbasin is within designated Wilderness or is roadless and riparian areas are largely unaffected by landscape scale human disturbances. The Middle Salmon-Chamberlain subbasin does not have enough managed PIBO sites to establish status or trend of stream habitat attributes (Saunders et al. 2020).

Middle Fork Clearwater Subbasin

The Middle Fork Clearwater subbasin is smallest on the Nez Perce-Clearwater National Forests. Land ownership in this subbasin is comprised of private, state, federal, and tribal holdings. The Forests manage about 55 percent of the subbasin. Lands are generally heavily forested.

Clear Creek is a tributary to the Middle Fork Clearwater River and contains much of the stream habitat accessible to anadromous and resident fish in this subbasin. It has high habitat potential for spawning and early rearing for anadromous fish. In 2011, the Forests Watershed Condition Class assessment (U. S. Department of Agriculture 2019) noted that 3 of 4 HUC12s in the Middle Fork were Functioning at Risk, and 1 was Properly Functioning.

Basin-wide surveys were conducted by contractor Stillwater Sciences in 2015 in the mainstem of Clear Creek and several tributaries, including Middle Fork Clear Creek, Brown Springs, Pine Knob, South Fork Clear Creek, and West Fork Clear Creek. Mean cobble embeddedness exceeded 30 percent across most surveyed reaches, although was less on reaches downstream of National Forest lands (Stillwater Sciences 2015). Survey results indicated very low levels of large wood in many reaches, as well as other indicators of simplified habitat including low numbers of pools. Sediment levels that exceed desired conditions have likely affected the quality and quantity of habitat available for trout and salmon.

In 2015 and prior the Clearwater National Forest contracted for six additional PIBO monitoring sites in Clear Creek, which is a tributary of the Middle Fork Clearwater (Archer and Ojala 2016). All of the metrics were not significantly different from reference conditions except large wood frequency, pool percent, and pool fines, which scored lower than reference sites. None of the metrics showed a significant change except bank angle, which moved away from reference conditions. (Archer and Ojala 2016). During the most recent sampling in 2019, the Middle Fork Clearwater subbasin did not have enough managed PIBO sites to establish status or trends of stream habitat attributes (Saunders et al. 2020).

South Fork Clearwater Subbasin

The South Fork Clearwater contains a mix of ownerships, but the Forests administer over 88 percent of the land area. Many areas of the subbasin have been extensively managed.

When habitat indicators are combined for the overall index value, managed sites scored lower than ecoregion reference sites (Figure 19). Of the seven indicators used, five were not significantly different from reference sites, and two, pool depth and pool percent, scored lower than reference sites. The overall index trended toward reference site values, as did D_{50}.

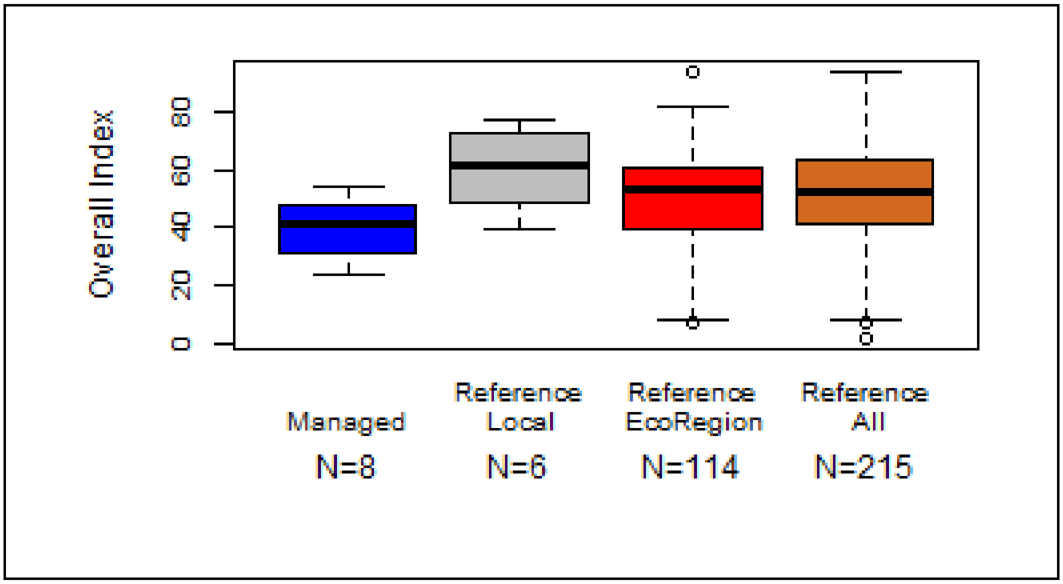


Figure 19. Overall index values in the South Fork Clearwater (Saunders et al. 2020). Median and range of index values for managed sites, local reference sites, reference sites within the ecoregion, and reference sites for the entire PIBO study area

Summary

For this exercise, the overall index value was provided as a figure, as it is derived from the individual stream attributes and can allow visual comparisons against reference conditions. Individual attribute data was also discussed when data was available in quantities large enough to statistically analyze. Two subbasins, the Lower Clearwater and South Fork Clearwater, each had three metrics that scored significantly lower than ecoregional reference sites, although they were different sets of metrics. The Lower Salmon had two metrics that showed departure, the Upper North Fork Clearwater showed two (one that scored lower and one that scored higher), and the Lochsa did not have any metrics that were different from reference conditions. Of those that were significantly departed, none of the metrics scored significantly lower across all subbasins. In addition, for all subbasins, many of the attribute values were not statistically different from reference conditions. As expected "managed" watersheds exhibit a wide range of conditions, some of which are degraded, while many are close to reference, or trending towards reference (Roper et al. 2019) Protections of stream courses since PACFISH/INFISH were implemented are considered to have had a positive effect on stream attributes.

Table 33. P-values associated with PIBO status index values from managed sites at the subbasin scale on the Nez Perce-Clearwater Forest 2001-2019. P-values lower than 0.1 indicate a significant difference between managed sites and eco-regional reference sites.

Managed Site	Overall	Pool Depth	Pool %	D_{50}	Pool Fines	Wood Freq.	Bank Angle	OE	Total Signif. Lower
Clearwater	<0.01[a]	0.81	0.29	0.09	0.03[a]	0.88	0.53	<0.01[a]	3
Lower Salmon	0.61	0.56	0.05[a]	0.3[a]	0.75	0.33	0.42	0.82	2
Upper North Fork	0.69	0.3[a]	0.79	0.02[b]	0.08	0.6	0.42	0.12	1
Lochsa	0.37	0.56	0.65	0.8	0.79	0.14	0.33	0.67	0

Managed Site	Overall	Pool Depth	Pool %	D_{50}	Pool Fines	Wood Freq.	Bank Angle	OE	Total Signif. Lower
South Fork Clearwater	0.02[a]	<0.01[a]	0.05[a]	0.87	0.4	0.46	0.9	0.34	3
Total Significantly Lower	2	2	2	1	1	0	0	1	N/A

a= this value scored significantly lower than the eco-region reference value

b= this value scored significantly higher than the eco-region reference value

A similar approach to trends at the subbasin scale can provide insight into how effectively PIBO standards are facilitating movement toward reference values (Table 34). From 2001 to 2019, most subbasin metrics (45/60) have not changed significantly, indicating that in most places and for most metrics, there has been a lack of degradation since the implementation of PACFISH/INFISH. Of those metrics that were significantly different, most (10 out of 15) have moved in the desired direction. All the subbasins showed more metrics trending toward desired conditions than away from desired conditions. Of those basins that exhibited trends away from desired conditions, only one (Lower Salmon) showed trends away from desired conditions in more than one metric.

Table 34. P-values associated with PIBO trends from managed sites at the subbasin scale on the Nez Perce-Clearwater Forest 2001-2019. P-values lower than 0.05 indicate a significant difference between 2001 and 2019 either toward or away from the desired direction.

Managed Site	Overall	Pool Depth	Pool %	D50	Pool Fines	LWD Freq.	Bank Angle	OE	Veg Stab.	Uncut %	Total Toward	Total Away	NC[c]
Clearwater	0.42	0.93	0.86	0.71	1	0.93	0.88	0.16	<0.01[b]	0.11	0	1	9
Lower Salmon	0.75	0.12	0.35	0.04[a]	0.75	0.04[a]	0.04[b]	0.08[a]	0.17	0.08[b]	3	2	5
Upper NF Clearwater	0.02[b]	0.24	0.35	0.48	0.93	0.64	0.2	0.31	<.01[a]	0.75	1	1	8
Lochsa	0.48	0.03[b]	0.88	0.66	0.94	0.18	0.51	0.06[a]	0.86	0.64	1	1	8
SF Clearwater	0.01[a]	0.21	0.33	0.01[a]	0.89	0.33	0.67	0.21	0.89	0.26	2	0	8
Selway	0.08[a]	0.35	0.35	0.04[a]	0.69	0.08[a]	0.89	0.35	0.67	0.27	3	0	7
Total Toward	2	0	0	3	0	2	0	2	1	0	10	N/A	N/A
Total Away	1	1	0	0	0	0	1	0	1	1	N/A	5	N/A
Total NC[c]	3	5	6	3	6	4	5	4	4	5	N/A	N/A	45

a: significant change toward desired direction

b: significant change away from desired direction

c: NC=No Change

Overall, status index scores in each subbasin for which data was available were divided by their respective ecoregional reference score to obtain an index ratio to facilitate relative comparison of overall condition across subbasins. According to this analysis the Upper North Fork Clearwater was in the best overall relative condition, followed by the Lochsa, Lower Salmon, South Fork Clearwater, and the Clearwater (figure 20).

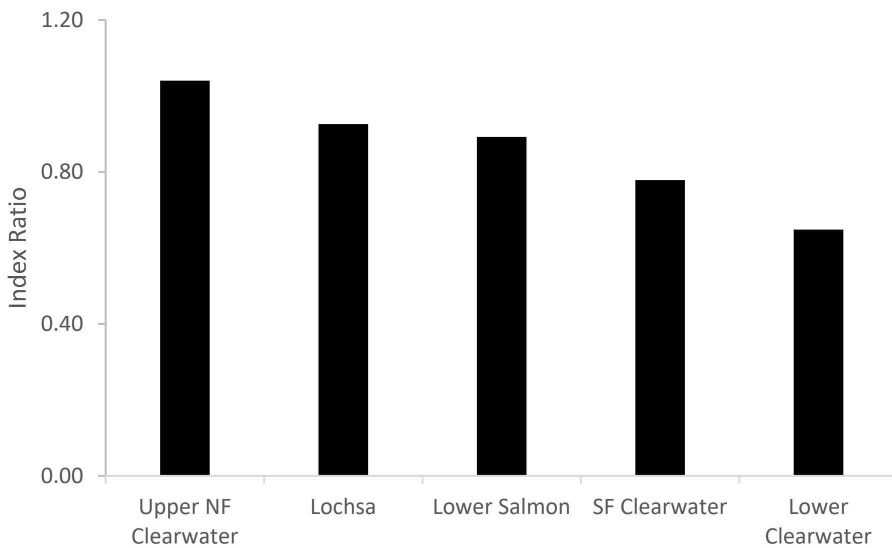


Figure 20. Ratio of 2020 PIBO overall index score to ecoregional reference score for five subbasins on the Nez Perce Clearwater National Forest. A value of 1 indicates equality with reference conditions.

Effects to Critical Habitat and Essential Fish Habitat

The effect sections of this programmatic biological assessment focus on two categories of actions/activities. The first category are indirect effects of proposed actions because they would not cause direct effects on the ground. For example, management area designations, establishing riparian management strategies, and selecting plan components are all proposed actions but are programmatic in nature such that they would only have indirect effects later in time. The second category are specific activities likely to occur in the future that would be guided by the forest plan but are not yet formally proposed. Examples include infrastructure use, vegetation management, mining, recreation, etc. The effects analysis for these activities would occur during future section 7 consultation after specific project proposals have been developed. Instead of an effects analysis in this document, the appropriate programmatic method for addressing these potential future activities is explaining how future actions guided by the plan might affect listed fish and critical habitat, given the potential land uses, description of desired components, and constraints imposed by standards and guidelines.

The U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) have identified nine physical or biological features (PBFs) that describe pathways needed to support critical habitat (originally called ‘primary constituent elements’ but officially changed to ‘physical or biological features’ effective March 14th, 2016; 81 FR 7413). PBFs include habitat elements such as spring, seeps, and groundwater; migratory habitats; abundant food base; complex habitats; water temperature; natural hydrograph; water quality and quantity; and low levels of nonnative predators and competition. For this biological assessment, physical or biological features for all critical habitats have been aligned via a crosswalk table because they are similarly worded and could be similarly affected by proposed actions (table 35).

Table 35. Standardized physical or biological features for the designated critical habitat of Bull Trout, Chinook Salmon (both ecotypes), and Steelhead.

Number	Bull Trout	Chinook Salmon	Steelhead
1	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows)	water quality, quantity, temperature	water quality, water quantity
2	Migration habitats	free of artificial obstructions	floodplain connectivity, free of obstructions
3	An abundant food base	food, natural cover,	forage
4	Complex environments/processes that maintain them	cover, shelter, riparian vegetation, natural cover, space	floodplain connectivity, free of obstructions, natural cover
5	Water temperatures ranging from 2 to 15 °C (36 to 59 °F)	water quality, quantity, temperature	water quality, water quantity
6	Substrate of sufficient amount, size, and composition	spawning gravel, substrate	water quantity and floodplain connectivity, physical habitat conditions
7	A natural hydrograph	water velocity	water quantity
8	Sufficient water quality and quantity	water quality and quantity	water quality and quantity
9	Sufficiently low levels of occurrence of nonnative fish	No equivalent	No equivalent

Indirect Effects of Proposed Actions

Management area allocations changes would be beneficial, and adverse for listed species' critical habitat and essential fish habitat. A beneficial change would occur from an increase in recommended wilderness by over 60,000 acres (table 4) Resulting recommended wilderness acres would be unsuitable for several activity types that otherwise could adversely affect PBFs (e.g., permanent road building) and constrain others (e.g., timber harvest); Refer to MA2-SUIT-RWILD plan components for complete suitability direction for recommended wilderness. Physical or biological features number 4 in particular would indirectly benefit from management area allocations as larger areas of recommended wilderness would maintain the types of natural processes that provide complex habitat, natural cover, and refugia.

Management Area 2 lands would shrink by 22,658 acres that would be converted to MA3 lands. The shift from MA2 to MA3 lands results from proposing fewer rivers for wild and scenic eligibility. The current number of rivers eligible for wild and scenic river designation would decrease from 29 under the 1987 plan to 12 under the proposed plan (11 suitable and 1 eligible). Most of the rivers that would lose eligibility are located in otherwise protected land allocations (e.g., Designated wilderness, Idaho Roadless Area, etc.). Portions of 6 rivers are located in areas that were previously managed for multiple use under previous forest plans, but the quarter-mile protection corridors were classified as MA2 for FEIS analysis purposes, based on the similarity between Wild and Scenic River protections and MA2 suitability. The changes in land allocation from MA2 to MA3 reflect removal of the quarter mile protection corridors from river segments otherwise in MA3 that will lose eligibility. For a more thorough discussion of the complexities associated with these land allocation comparisons, see the discussion under the Eligible and Suitable Wild and Scenic Rivers section in the Effects of the proposed action of the Grizzly Bear analysis.

Most stream and riparian protections would not be compromised by changing allocation from MA2 to MA3 because the current quarter-mile protection corridors (cumulatively equates to the 22,658 acres that would change from MA2 to MA3) afforded by the National Wild and Scenic Rivers System Act is larger than necessary to protect nearly all stream functions. With the change to MA3, stream and riparian processes formerly protected by the corridor will still be maintained by proposed RMZ distances and numerous plan components that protect stream processes and are designed to move riparian habitat toward desired conditions. For example, RMZ plan components such as FW-DC-RMZ-01, 02 provide guidance for management activities to re-establish disturbance patterns in areas where it is lacking. While RMZs will protect nearly all stream functions, roads can be built, and if necessary, can cross through RMZs, which could have short-term adverse effects. Even if a crossing were to occur, plan components that restrict activities retarding attainment of desired conditions would be effective in preventing or minimizing long-term adverse effects.

Some concern related to the possible need for a larger road network has also arisen during the plan revision stemming from the offer increase in the timber objective FW-OBJ-TBR-01. This objective raises the amount typically offered annually (55 million) to 190-210 million board feet per year. This volume increase could be considered to require a corresponding increase in the road network, especially in MA2 Backcountry. Of particular concern is the large portion of MA2 (approx. 1,482,000 acres) that is identified and managed under the Idaho Roadless Rule (IRR). While the Idaho Roadless Rule combined with this proposed new Plan does allow minimal timber management and road building, it is extremely limited by IRR themes and permission requirements.

By example, the 2008 Idaho Roadless Rule predicted only 1,500 acres of roadless would be treated by decade on the Nez Perce Clearwater. From 2008 to 2018, approximately 1,800 acres were treated. The 300-acre increase over estimated likely occurred from treatments associated with extreme fire years of the 2012 and 2015. Over the ten years, treatments occurred where fuel breaks were constructed during fire suppression, where roadside hazard trees were removed after fire, and from planned projects designed to create community protection zones. Over this time period, no permanent roads were created; a total of 2.4 miles of temporary road were authorized for the Orogrande Community Protection Project. This amount of harvest and use is expected to continue under the proposed plan.

Suitability of motorized and non-motorized access proposals have the potential to adversely affect PBF 6 and the water quality components of PBFs 1 and 8 because lands suitable for motorized use are proposed to increase for both summer (45 percent to 55 percent) and winter (39 percent to 60 percent; table 5); Roads and trails that support motorized use can cause sedimentation and large woody debris issues if not hydrologically disconnected. However, proposed standards and guidelines are expected to mitigate these effects. For example, FW-STD-ARINF-01 says: “Road maintenance and new road construction shall be designed to minimize adverse effects to threatened, endangered, proposed, or candidate aquatic species and their habitat,” and FW-GDL-ARREC-02 says: “To reduce potential adverse effects to water quality and aquatic resources, construction of new facilities or infrastructure within floodplains should be avoided. Where new activities inherently must occur in riparian management zones (e.g., at road and trail stream crossings, boat ramps, or docks), they should be located and designed to minimize adverse effects to floodplains and other riparian-dependent resource conditions (e.g., within geologically stable areas and avoiding major spawning areas).” These standards and guidelines would be expected to ensure that if adverse effects to PBFs were to occur in the future as the result of these motorized access suitability proposals, they would be minor and not lead to adverse modification or hinder recovery to conditions described by desired conditions.

The aquatic and riparian conservation strategy (ARCS, draft ARCS) in the revised forest plan is expected to be beneficial for critical/essential habitat as several RMZ and CWN plan components were specifically designed to maintain the intent of PACFISH/INFISH direction (e.g., FW-RMZ-STD-07; Appendix E); the same direction that was largely responsible for passive restoration and upward trend in habitat conditions documented by the PIBO program (Roper 2020). But unlike the focus on passive restoration under the 1987 forest plans as amended by PACFISH/INFISH, the revised forest plan includes components that also emphasize active restoration. For example, FW-OBJ-RMZ-01 says: “Improve 300 to 700 acres of riparian habitat every 5 years, through improvements that are intended to meet desired conditions for riparian management zones, such as road obliteration, riparian planting, hardwood restoration, post assisted log structures, beaver dam analogs, and reconnecting floodplains by removing road prisms or berms.” This increased capacity for active restoration has the potential to have long-term beneficial effects to all PBFs. Identifying inner and outer zones of RMZs that clearly allow for active restoration to occur where desired conditions are not currently being met as opposed to PACFISH/INFISH that was often interpreted as ‘exclusion zones’ or areas that were not readily available for active management.

Indirect effects of proposed actions such as the monitoring program, potential management approaches, and other plan content would also be beneficial long term for critical/essential habitat as these elements are designed to facilitate implementation of the new forest plan. And because the net effect of most other proposed actions as described above are beneficial, proposals to evaluate progress towards meeting desired conditions and engage in partnerships, establish priority watersheds, etc. would likewise have a variety of effects on all PBFs. There are several relevant roles of plan components, which include limiting adverse effects of forest management, and promoting effective restoration and mitigation. When considering the plan as a whole, some plan components may have short term negative effects on aquatics, that are at least partly reduced by potential management approaches; and some components such as those promoting restoration will have long term beneficial effects.

One of the assumptions of the PIBO monitoring is that the selected stream reaches withing an ecoregion are representative of conditions within that ecoregion. The large-scale sampling design has been shown to be statistically robust and is intended to provide accurate monitoring of trends without having to sample every single stream or stream reach. In addition, some of the bull trout core areas are primarily in MA1 and would not be likely to exhibit downward trends due to active forest management, as none occurs there. Where management does occur, it is guided by plan components that require USFS BMP's to be used. The BMPs are built upon decades of monitoring to ensure that management minimizes or avoids deleterious effects on critical habitat.

The net effect of proposed plan components is expected to be beneficial in the long term for critical/essential habitat for the reasons stated above. The primary reason for this is the inclusion of desired conditions that identify what future projects would be designed to achieve. For example, projects in watersheds that contain designated critical habitat would have to “contribute to and enhance the conservation of aquatic species of conservation concern and recovery of threatened or endangered fish species” (FW-DC-CWN-01); “provide habitat that supports robust native fish populations, which are able to expand to and recolonize adjacent unoccupied habitats” (FW-DC-CWN-02); and ensure “critical habitat components (primary biological features) provide the ecological conditions necessary to achieve species recovery. Spawning, rearing, and migratory habitat are widely available and inhabited. Listed aquatic species have access to historic habitat and appropriate life history strategies (e.g., bull trout resident, fluvial, adfluvial; and salmonid anadromy) are supported” (FW-DC-WTR-10). It is important to note that while some plan components could temporarily have some adverse effects to critical habitat (e.g., FW-OBJ-TBR-01: Offer 190-210 million board feet timber per year.), those components would be implemented in a way that does not compromise the above-mentioned desired conditions for critical habitat. The following section provides additional information on how proposed plan components would guide the management of future activities.

Management of Activities Likely to Occur

This section describes activities likely to occur that would be guided by proposed forest plan components. Also refer to Appendix F. Physical and Biological Features Crosswalk Table for a crosswalk of how plan components address each of the critical habitat PBFs.

Infrastructure

The revised plan carries forward components and the intent of PACFISH/INFISH with some modification. For example, under the 2012 planning rule, Standards and Guides are not allowed to compel action, therefore the verbiage is changed for some components in the revised plan. In the place of those components, the Revised Plan has a far-reaching desired condition FW-DC-ARINF-01. It states, “The transportation system has minimal impacts on aquatic and riparian conditions through reduced hydrologic connectivity of roads to streams, lower sediment delivery to streams, reduced road impact to floodplains, and improved aquatic organism passage, where transportation infrastructure affects these features.” Under the revised plan, all road planning and activities must be designed to move the road system towards this desired condition. With addition of this desired condition, specific standards and guidelines that compel action under PACFISH/INFISH are not carried forward. An example would be PACFISH RF-2 c.2. which required developing a Road Management Objective for every road segment.

In addition to desired conditions, standards, guides, and goals, the revised plan has objectives. In the Forest Service Directives, *objectives* under the 2012 Planning Rule are described as, “A concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonably foreseeable budgets.” The Conservation Watershed Network (CWN) section of the revised forest plan has objectives for assessment of roads, regardless of maintenance level, to identify road segments likely to be negatively impairing aquatic conditions. That information can be used to identify segments needing storm-proofing (discussed below).

The revised forest plan carries components forward that restrict actions associated with existing road management that could otherwise retard attainment of aquatic restoration. The revised forest plan also contains components that restrict placement and construction of new roads such that the road network “has minimal impacts on aquatic and riparian conditions” (FW-DC-ARINF-01), and “road maintenance and new road construction shall be designed to minimize adverse effects” to listed species and their habitat (FW-STD-ARINF-01). Under the existing plans, the Forests have decommissioned 19 percent of the specified road system since PACFISH/INFISH in 1995 (figure 14). Desired Conditions in the Revised Plan state that the road system is needed to “serve land management and public needs and purposes” (FW-DC-INF-01). The component FW-DC-INF-02 states, “Roads not needed to serve management and public needs and purposes are absent.” When considered together, these two desired conditions acknowledge the desire of the public retain access to National Forest lands while at the same time, roads that are not needed for access or management will be reduced during future projects.

In order to balance social, economic, and ecologic sustainability, and to support rural communities, guideline FW-GDL-ES-01 requires the Forests to retain public access to areas that currently have open motorized access, in the summer or winter. When a route is identified as adversely affecting aquatic resources, the component guides maintenance or rerouting to be considered as alternatives to closing the route. If the route must be closed, the guideline states an alternative route should be provided. This guideline does not prohibit road closures per se, but it does provide a framework of alternatives that should be followed before implementing a closure. While FW-GDL-ES-01 guides maintaining existing travel routes for the public, it does not prevent removal of a harmful road segment, especially when an alternative access route is available.

In addition, FW-OBJ-WTR-02 aims to “enhance or restore” 50 to 100 miles of stream in naturally unconfined channels every 5 years to maintain or restore structure, composition, and function of habitat for fisheries and other aquatic species in streams with legacy effects that caused channels to become straightened or incised, impaired beaver habitat, or diminished floodplain capacity. Activities include, but are not limited to, berm removal, large woody debris placement, streamside road decommissioning, riparian planting, beaver dam analogs, and process-based restoration/floodplain restoration. Additionally, FW-OBJ-INF-01 aims to “Complete 600 miles of road work, such as reconstruction; re-routing; road improvements; decommissioning; or placing roads in intermittent stored service, every 5 years. Priorities shall include reducing effects on desired aquatic and riparian conditions from chronic sediment delivery or potential future road prism failures, including previously decommissioned roads where drainage features have failed.” Additional plan components, such as FW-DC-INF-02 “Roads not needed to serve management and public needs and purposes are absent” provide the pretext for removing system roads that are not needed for management or public purposes during travel planning. Additionally, FW-DC-INF-02 applies to non-system roads and routes that are on the landscape but not part of the transportation system. Removal of these unneeded roads from the landscape, particularly those near streams, can significantly reduce sediment production (Madej 2001).

Some roads are deemed important for future, but not current use, and are placed in storage. USFS roads that are not in use for periods of one year or more are Operational Maintenance Level 1 roads per the Forest Service Handbook (FSH 7709.59 62.32). Treatment for storing roads ranges from no ground disturbance activities to removing drainage structures. Site specific analysis is used to determine what treatment, or combination of treatments would be appropriate for specific locations. Stored roads with a high potential to impact natural resources may warrant more intensive treatments, such as removal of culverts or prism modification. It may be appropriate to store roads that have minimal potential to impact natural resources with less intensive treatments, such as blocking the road entrance, installing waterbars, and seeding disturbed areas. Selecting appropriate treatments for road storage requires consideration of existing and future use, potential resource impacts, length of time the road is in storage, cost to implement treatments, and available funding. A more detailed description of the road storage and decommissioning decision making and procedures used by the forest service can be found in the publication Guidelines for Storing and Decommissioning Roads (U.S. Department of Agriculture 2018b). A more detailed description of the conditions associated with storage roads on the Nez Perce-Clearwater National Forest (including photographic examples), is provided under the “Travel Management” heading under “Activities Likely to Occur Under the Land Management Plan” heading in this document. The ground disturbance associated with decommissioning a road that is already in a hydrologically stable condition can sometimes create more initial sediment input to streams than leaving the same road in storage, and although both types of treatments can lead to similar aboveground properties, belowground properties and ecosystem processes can be altered ((Lloyd et al. 2013). Effects of road treatments and road status are highly dependent upon many factors such as slope, soil type, and road location. Thus, decisions concerning appropriate road treatments are best evaluated at a site-specific project level. In the process of doing those evaluations, the revised forest plan will guide efforts through plan components that are intended to keep the focus of all management activities on the attainment of desired conditions.

Aquatic components in the revised forest plan support a naturally functioning sediment regime that supplies of the “types, quantities, and rates” of sediment that “support the natural…substrate composition” for the benefit of listed species and their habitat (FW-DC-WTR-06, FW-STD-ARINF-01). Within the CWN, road projects or projects with road-related components will be designed to support and “not retard” processes of natural habitat creation, maintenance, and recovery (FW-STD-CWN-01), in part by reducing the hydrologic connectivity of the road network (FW-STD-ARINF-07). One way to reduce hydrologic connectivity is storm proofing, also called Storm Damage Risk Reduction. Storm proofing is a process where non-recuring treatments are applied to existing roads to reduce the potential for resource impacts from road feature failure. Treatments include increasing the size and decreasing the spacing of drainage features, fortifying stream crossings, and stabilizing slopes. Plan component FW-OBJ-CWN-02 will target 15 percent of the road mileage every 5 years in the CWN. As indicated in Appendix 4 of the revised forest plan, section 1.11.3 Road Storm Proofing, potential management approaches include utilizing road storm proofing techniques following Keller and Ketcheson (2015) or similar, and the U.S. Forest Service Transportation Resiliency Guidebook - Addressing Climate Change Impacts on U.S. Forest Service Transportation Assets (U.S. Department of Transportation 2018). As culverts are replaced either for road maintenance purposes or as a restoration component of larger projects, or in the event a new road is constructed across a stream, new stream crossing structures will allow for aquatic organism passage where desirable and feasible (FW-GDL-ARINF-11; PBF 2). In addition, the revised plan includes a desired condition, FW-DC-ARINF-02, which states: "The transportation network is resilient to the effects of climate change, including the ability to accommodate increased runoff and peak flows that may exceed historic streamflow events", which is designed to address climate uncertainty.

Site specific improvements can be made to reduce effects, particularly those associated with streamside roads and stream crossings. While some adverse effects to stream habitats are likely to occur due to the existing road network, guidelines in the plan aim to reduce those risks to the extent feasible and utilize a proactive approach to road design, construction, and maintenance (GDL-ARINF-01-07, 09-11). Additionally, project-specific best management practices (BMPs), including both federal and state BMPs, shall be incorporated into project planning as a principal mechanism for controlling non-point pollution sources, to meet water quality desired conditions, and to protect beneficial uses (FW-STD-WTR-02**)**. Best management practices for road related operations can be found in the Soil and Water Conservation Practices handbook (U.S. Department of Agriculture 1988), the Idaho Forestry Best Management Practices Field Guide: Using BMPs to Protect Water Quality (University of Idaho Extension Office 2015), and the National Best Management Practices for Water Quality Management on National Forest System Lands Technical Guide (U.S. Department of Agriculture 2012b). Shaping road surfaces to drain as designed, constructing or reconstructing drainage control structures as needed, ensuring ditches and culverts functioning, not permitting side casting of maintenance-generated debris within the RMZs, and designing stream crossing structures to have sufficient capacity to convey the design flow without appreciably altering streamflow characteristics are a few examples of best management practices. The U.S. Forest Service's San Dimas Technology and Development Center completed a literature synthesis describing the effectiveness of best management practices that have application to forest roads (Edwards et al. 2016). The report concluded that based on the results of most of the studies, most BMPs result in some level of effectiveness in terms of reduced sediment generation or transport, although wide ranges of BMP effectiveness were reported in many of the studies.

The plan components related to road management are designed to reduce baseline, non-project specific, and project-specific impacts to streams related to roads and therefore "not retard" natural rates of recovery. Two plan components that specifically help to manage road sediment include FW-OBJ-CWN-02 ("Stormproof 15 percent of roads in Conservation Watershed Network prioritized for restoration every 5 years...") and FW-GDL-ARINF-01 ("Construction, reconstruction, and maintenance activities of roads, skid trails, temporary roads, and airstrips, should hydrologically disconnect the drainage system from delivering water, sediment, and pollutants...."). While sediment generated from unpaved forest roads has been studied for decades (Alvis et al. 2023), some additional review is warranted here because the amount of haul that could occur on unpaved roads could increase from 12,300 trips currently to about 40,000 trips annually. Causes of sediment generation can arise from a lack of surface aggregate (Brown et al. 2015) crushing surface aggregate from heavy road traffic (De Witt et al. 2020), and scattering surface aggregate and rutting (Alvis et al. 2023). While forest roads can be designed to minimize erosion and result in considerably less sediment mobilization (Ketcheson and Megahan 1996), additional site-specific BMPs and design features may be needed during project level NEPA to help achieve desired conditions and minimize adverse effects that could occur from increased road traffic. Treatments that could minimize sediment delivery from heavy road use could include placing cross drains near perennial streams to ensure ditch water is not delivered to the stream network, increased road maintenance to prevent rutting and puddling, haul restriction during rain events, increased rates of aggregate application near stream crossings, and using higher quality aggregate when available. While sediment delivery during haul would be minimized, some short-term adverse effects are still likely to occur.

Currently, about 1,200 miles of Forest roads are maintained each year. Objectives in the revised plan identify a goal of 1,400 miles of road maintenance per year (FW-OBJ-INF-02). Gravel surface replacement is currently accomplished on the Nez Perce-Clearwater using timber harvest receipts and approximately 25 percent of forest road maintenance is performed by timber purchasers; it is expected that the amount of road maintenance performed by timber purchases would remain commensurate under the new plan (i.e., if timber sales increase, the amount of road maintenance they perform would also increase).

Appendix B. Land Management Plan (Proposed Action) contains all revised forest plan components where those designed to guide management of infrastructure near streams are coded as ARINF.

Vegetation Management

The revised plan authorizes and guides vegetation management, including commercial timber sales and non-commercial vegetation management activities. In the revised forest plan, proposed riparian management zones (RMZs) remain the same as riparian habitat conservation areas (RHCAs) in PACFISH/INFISH or are slightly wider as non-priority watershed intermittent streams have an increase of 50 feet. Distinctions have been made in the revised forest plan to clearly identify what kinds of actions are appropriate and inappropriate within the RMZ (FW-STD-RMZ-07).

Along Category 1 fish-bearing streams, the riparian management zone (RMZ) consists of, "the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge; or to the outer edges of the 100-year floodplain; or to the outer edges of riparian vegetation; or to a distance equal to the height of two site-potential trees; or 300 feet slope distance equaling 600 feet total, including both sides of the stream channel, whichever is greatest. Riparian management zones begin at 150 feet on non-fish-bearing perennial streams and 100 feet on seasonally intermittent streams (see riparian management zone definitions in the revised forest plan for more specifics including lakes and ponds). Seasonally intermittent streams utilized by fish would be treated as fish-bearing streams. Desired conditions of the revised plan include RMZs that reflect native plant communities and support the landscape processes that create and maintain cool, clean, complex, and connected instream habitat (FW-DC-RMZ-01/02, FW-DC-TE-05). Timber harvest would not occur on particularly vulnerable ground (FW-STD-TBR-02) or using means or in locations where impacts might outweigh economic returns (FW-STD-TBR-04). Guidelines aim to prevent adverse impacts to streams by avoiding logging-related activities in RMZs and yarding timber over streams rather than through them (FW-GDL-RMZ-02/03). Objectives target activities to steer RMZs closer to reference conditions (FW-OBJ-TE-01, FW-OBJ-RMZ-01).

Per FW-STD-RMZ-01, limited timber harvest could occur within the first site potential tree height distance from streams if needed to restore or enhance aquatic and riparian resources. Trees harvested must be left on site or used for aquatic restoration (FW-STD-RMZ-01). While trees cut could potentially interact with other processes, especially stream temperature, desired condition FW-DC-WTR-05 guides projects to meet state beneficial needs, which would limit harvest if tree cutting increased thermal input to the point where beneficial uses could not be met. Other typical examples of allowable treatment in the inner Riparian Management Zone (RMZ) include hand thinning to underplant native hardwoods species which would move an RMZ closer to reference conditions if hardwoods were under-represented in that sub-watershed. Vegetation management could occur within the second site potential tree height distance provided that the “functions” relative to stream habitat of the outer RMZ were retained (FW-STD-RMZ-01). At least 10 percent of the trees harvested from the second site potential tree height area would be used for aquatic restoration on the Forests (FW-OBJ-RMZ-02).

Vegetation management within riparian areas would largely be addressed by riparian management zone (RMZ) plan components designed to support two desired conditions: “RMZs reflect a natural composition of native flora and fauna and a distribution of physical, chemical, and biological conditions as compared to reference conditions. The species composition and structural diversity of native plant communities in riparian management zones provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration. Nutrients, large woody debris, and fine particulate organic matter are supplied in amounts and distributions sufficient to sustain physical complexity and stability” (FW-DC-RMZ-01); and “RMZs feature key riparian processes and conditions that function consistent with local disturbance regimes, including slope stability and associated vegetative root strength, wood delivery to streams and within the RMZs, input of leaf and organic matter to aquatic and terrestrial systems, solar shading, microclimate, and water quality” (FW-DC-RMZ-02). The revised forest plan also contains two objectives, seven standards, and ten guidelines (Appendix B). Many of the aquatic protections established by PACFISH/INFISH are continued by RMZ plan components (Appendix E. Crosswalk of Standards and Guidelines Between PACFISH/INFISH and the Land Management Plan Aquatic Ecosystem Plan Components), most notably of which is FW-STD-RMZ-07 that translates RHCA stream buffers into inner and outer RMZ management zones.

Proposed vegetation management could occur on approximately 12,251 acres annually, offering 190-210 million board feet (FW-OBJ-TBR-02). Minimization of the potential risk to water resources will rely on the effectiveness of RMZs that work well for protecting stream functions, while timber harvest openings outside RMZs may more closely resemble the effect of natural disturbances on hydrologic and sediment delivery regimes due to the DC described above and several other components that address hydrologic effects. Additionally, project-specific best management practices (BMPs), including both federal and state BMPs, shall be incorporated into project planning as a principal mechanism for controlling non-point pollution sources, to meet water quality desired conditions, and to protect beneficial uses (FW-STD-WTR-02). Best management practices for vegetation management related operations can be found in the Soil and Water Conservation Practices handbook (U.S. Department of Agriculture 1988), the Idaho Forestry Best Management Practices Field Guide: Using BMPs to Protect Water Quality (University of Idaho Extension Office 2015), and the National Best Management Practices for Water Quality Management on National Forest System Lands Technical Guide (U.S. Department of Agriculture 2012b). Designing mechanical vegetation treatment prescriptions to limit site disturbance, soil exposure, and displacement; locating landings, skid trails, and slash piles in suitable sites to avoid, minimize, or mitigate potential for erosion and sediment delivery to nearby waterbodies; and applying soil protective cover on disturbed areas to prevent accelerated erosion are a few examples of best management practices.

Regarding sediment delivery related to peak flow, a recent study has been published to help disentangle increasing peak flows from increasing sediment delivery. Safeeq et al. (2020) found that increased amounts of sediment had more to do with disturbance related to vegetation management that did not leave buffer strips. Restricting activities that bare soils next to streams may be more important than increases in peak flow when considering sediment delivery.

Landscape analysis for the revised plan found a forest-wide average disturbance patch size of 350 acres. Plan components focus forest management at the broad potential vegetation type scale. Average patch size varies by broad potential vegetation type with mean averages between 61 to 122 acres. Across broad potential vegetation types, patch sizes range between 25 and 2,680 acres in size. Desired conditions for target average patch size vary by broad potential vegetation type as detailed in Appendix 4 of the revised plan – potential management approaches with the smallest patches associated with the warm dry potential vegetation type (PVT) and the largest patches associated with the cool moist PVT. The revised plan details standards for exceptions which allow the maximum forest opening size to increase from 40 to 207 acres (FW-STD-TBR-06) as described in 36 CFR 219.11 (d)(4)(i). The rationale for utilizing these exceptions at a project level must include restoring ecological conditions or resiliency—e.g., restoring a fire regime when currently departed, or moving towards a condition within the natural range of variation. This standard applies to forest opening created through mechanical harvest operations only and does not apply to openings created through prescribed fire. It is expected that very few proposed regeneration harvest units would reach 207 acres in size due to both target patch sizes for broad PVT groups and limitations of landscape topology which typically constrain opening size. Currently, the average patch size created by even age regeneration harvest on the Forest is 22 acres, and 90 percent of all openings that exceed 40 acres are less than 125 acres. That is because factors such as slope, elevation, aspect, location of riparian areas, etc. generally preclude the existence of large heterogenous timber stands that would all require a uniform silvicultural prescription (i.e., given the patchy nature of landscapes in the action area, it is fairly rare to find a treatment area at the scale of 207 acres that would represent a consistent stand for which a single silviculture prescription could be applied). Increasing the average patch size above 22 acres is important ecologically to reduce the amount of edge effects, to allow larger stands of mature forest in the future and to give larger patches for wildlife that require them. Openings larger than 125 acres are unlikely to become more common than they currently are due to the topological constraints that currently limit opening size. Larger openings to be more consistent with the natural range of variation would necessarily be created by wildland fire rather than through timber harvest. This maximum patch size standard approximates the average patch size of disturbance events occurring within the natural range of variation on the forests such that hydrologic regimes would more closely resemble natural patterns by increasing the size of openings. But because there is a great deal of uncertainty regarding effects to streamflow in particular, a management approach (Appendix G. Approach to Assess Water Yield and Peak Flow) related to plan component FW-DC-WTR-07 was developed that can guide development of an adequate and standardized assessment of potential effects on water yield and peak flows associated with project activities and natural disturbances to provide a consistent approach to determine water yield associated with amount of area harvested. This management approach provides project level planning guidance focused on mitigating potential effects of forest openings.

Managed Wildfire and Prescribed Fire

As fire is the key natural disturbance on the Forests, prescribed fire may be authorized in RMZs, provided "aquatic and riparian-associated resources are maintained" (FW-STD-RMZ-01). Proposed guidelines seek to minimize adverse impacts to streams during management activities related to fire. FW-GDL-WTR-07 protects RMZs by limiting where and how fireline can be constructed in RMZs so that sediment delivery to waterbodies is minimized and capture of overland flow is limited. Regarding direct ignition of low intensity prescribed fire in RMZs, FW-STD-RMZ-06 states the activity will only be allowed when, "direct ignition within the riparian management zone will not retard attaining water, aquatic, and riparian desired conditions;" and "direct ignition within the riparian management zone maintains or enhances existing stream conditions and effects to threatened or endangered species and their designated critical habitat are considered."

Salvage is unlikely to occur anywhere in RMZs unless it can be shown that aquatic and riparian resources can be maintained and not retarded (FW-STD-RMZ-01). Numerous other guidelines pulled forward from PACFISH/INFISH protect the riparian from the actions pursued to manage wildfires. FW-GDL-RMZ-04 guides aerial retardant use to avoid application in mapped aerial retardant avoidance areas for the protection of RMZs; FW-GDL-RMZ-05 guides incident bases, staging areas, etc. to be placed outside of RMZs or take mitigation actions if no alternative exists; FW-GDL-RMZ-06 guides machine line to be constructed outside RMZs, and if it must occur through RMZs, it should cross perpendicularly; FW-GDL-RMZ-07 guides restoration of any fire suppression activity that could deliver sediment to streams; and FW-GDL-RMZ-08 guides suppression activities to avoid pumping water directly from a stream

Allowing naturally ignited fires to play their ecological role, particularly in wilderness areas and designated roadless, will produce long-term beneficial effects to aquatic habitat and aquatic species (FW-DC-FIRE-01, FW-OBJ-FIRE-03). Rieman et al. (1997), Jakober (2002) documented increased abundance of fish after fires, even in reaches where the fire had resulted in the local extirpation of fish. (Sestrich et al. 2011) documented a decline in non-native brook trout over time and rapid recovery of native westslope cutthroat trout in severely burned areas in the Bitterroot River, indicating fire may have shifted the competitive advantage in the favor of the native species. At a landscape scale, suppressing fire and reducing its natural effects poses a greater risk to long-term aquatic process and function than the effects of wildfire. Prescribed fire and ecologically beneficial wildfire will promote PBFs 3, 4, 6, and 5 by allowing the natural disturbance regime to fuel the stream habitat process that evolved within it.

Wildland fire in riparian areas can help stands move towards reference conditions when it removes excessive fuel loads that otherwise would not have accumulated without fire suppression. Wildland fire, be it prescribed or naturally ignited, can adversely affect stream habitats in its immediate aftermath, it is the natural driver of disturbance on the forests and thus is integral to the landscape processes that create and maintain instream habitat. Proposed RMZs, nearly identical to RHCAs, would continue to help create and maintain complex habitat (PBFs 3, 4, 6). It’s likely that the proposed RMZs would help keep streams cool (PBFs 2, 5, 8). RMZs provide for clean habitat by filtering overland sediment transport and protecting streambank integrity, two processes that maintain natural sediment routing (PBFs 3, 4, 6, 8). Higher water yields or other changes in the hydrograph could adversely affect PBF 7, but this does not necessarily correlate to increased sediment yield (PBF 6).

Mining

According to the Designated Wild and Scenic Rivers section of the EIS (3.6.1.2), while “potential for locatable minerals does exist” in the designated portions of the Middle Fork Clearwater River (including the Lochsa and Selway rivers), “there are no valid existing rights, therefore no potential for mining operations” within those corridors. Much of the rest of the streams on the Forests are however eligible for mining, provided the noted requirements are met.

To protect riparian and instream habitat, the Nez Perce-Clearwater proposes standards and guidelines that include the requirement of a reclamation plan and a reclamation bond for mining activities in RMZs (FW-STD-AREM-01); limiting mine waste in RMZs (FW-STD-AREM-02); limiting mineral operation in RMZs unless strict adherence to guidance is followed (FW-GDL-AREM-01/02); controlling water flow paths to maintain water quality and to prevent biological, chemical, or industrial pollutants from being delivered to water bodies (FW-GDL-AREM-03); and requiring the inclusion of best management practices into plans of operations (FW-GDL-AREM-04). Best management practices for mining operations can be found in the Idaho Administrative Code IDAPA 20.03.01 (see the project record, IDL_2022_Rules_Governing_Mining), the Manual of Best Management Practices for the Mining Industry in Idaho (Idaho Department of Lands 1992), Forest Service Soil and Water Conservation Practices (U.S. Department of Agriculture 1988), and the National Best Management Practices for Water Quality Management on National Forest System Lands Technical Guide (U.S. Department of Agriculture 2012b) such as adhering to instream work windows, not discharging wastewater to streams, keeping disturbed areas to a minimum at any given time through concurrent reclamation; and seeding disturbed soil after completion. Lands impacted by mining shall be returned to a pre-disturbance topographical state (FW-STD-EM-01). Some proposed potential management approaches related to general recreation may apply to mining operations in RMZs, including those related to camps and sanitation in RMZs, for example (see Appendix 4 of the Revised Plan, section 1.16.2 Developed and Dispersed Sites).

Mining will likely adversely affect listed fish and critical habitat, as the techniques used, including suction dredging or placer mining, interrupt natural stream maintaining processes. PBFs sensitive to sediment deposition (2, 4, 6, and 8) could continue to be affected by mining, though monitoring suggested the magnitude of this means of disturbance has been minor in the recent era. The Forest Service has only limited authority to regulate mining, particularly for locatable minerals, and therefore some, even foreseeable impacts would be beyond the purview of the forests. Minerals activities that are ground disturbing and that utilize equipment require a plan of operation be submitted for approval. Section 7 consultation would occur on each of these actions that are likely to occur over the life of the plan. It is not possible to predict when and where plans of operation would be submitted, or the potential environmental impacts of these operations at the Forest scale. A guideline, FW- GDL-AREM-05, states "to minimize harm to listed fish and their critical habitat from suction dredge mining, Plan of Operations (POO) should be required of miners for proposed dredging in streams with ESA listed fish species or critical habitat. The POOs should include provisions consistent with Idaho Department of Water Resources to limit mining activities to specified times and methods that serve to avoid or minimize, where feasible, adverse effects such as: dewatering streams or blocking fish passage; destabilizing or undermining stream banks and large wood; and excavating potential spawning areas or covering them with spoils." Thus, the plan components listed above are designed to ensure minimum requirements are met while relying on project level site specific analysis and consultation to determine potential adverse effects from specific proposed actions.

Currently there are no leaseable minerals activities on the Forest. Saleable mineral materials are made available by the Forest. Permitting removal of these materials, unlike locatable minerals, are discretionary actions. Plan components FW-STD-AREM-01, FW-STD-AREM-03, FW-GDL-AREM-01 and FW-GDL-AREM-04 would apply. The limited discretion provision in FW-GDL-AREM-01 would not apply to leaseable or saleable materials, thus, should project level site specific analysis find that an action would retard attainment of aquatic and riparian desired conditions, that action would not be allowable under the plan and the project could not go forward.

According to the Designated Wild and Scenic Rivers section of the EIS (3.6.1.2), while "potential for locatable minerals does exist" in the designated portions of the Middle Fork Clearwater River (including the Lochsa and Selway rivers), "there are no valid existing rights, therefore no potential for mining operations" within those corridors. Much of the rest of the streams on the Forests are however eligible for mining, provided the noted requirements are met.

Livestock Grazing

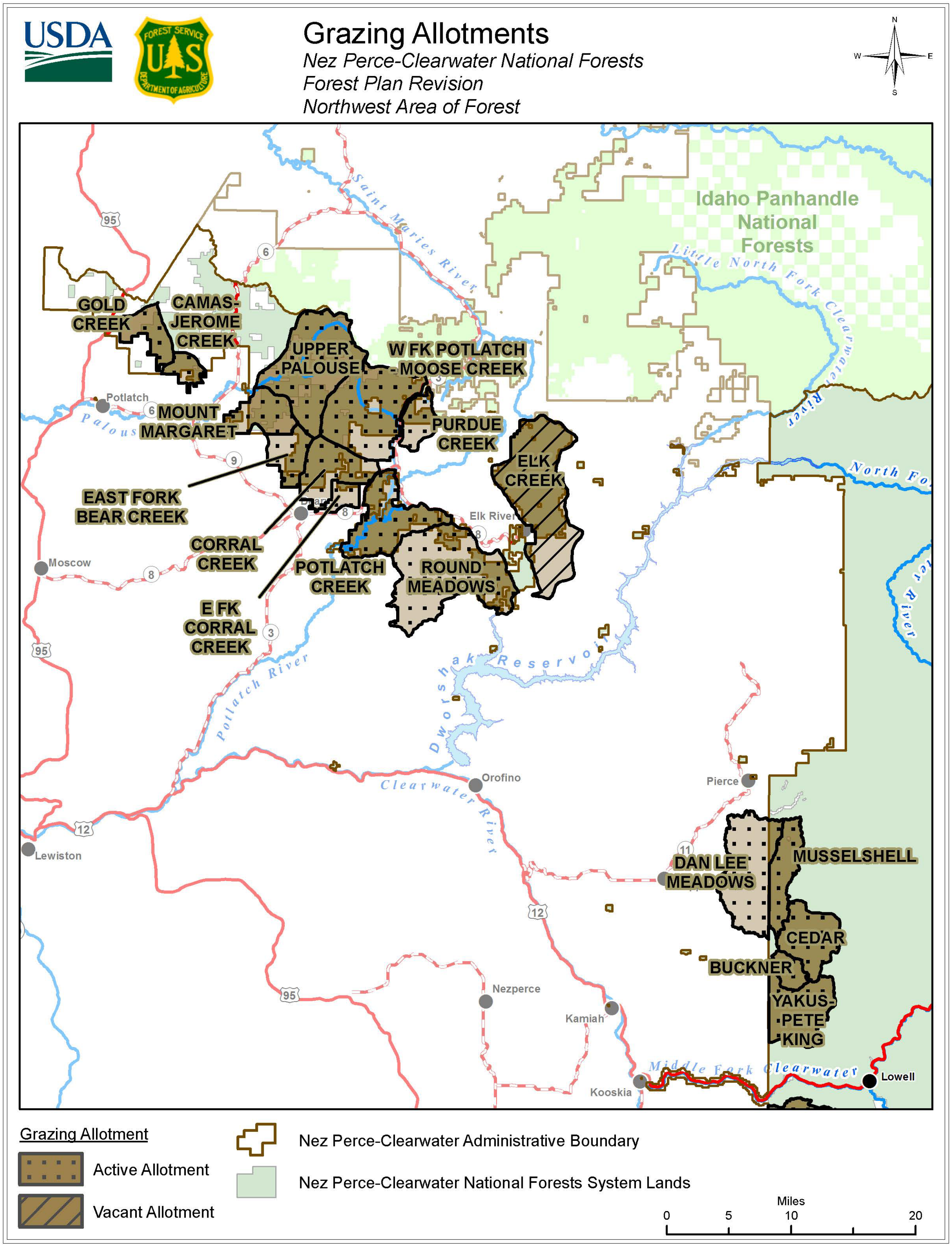
About 15 percent of the land area of the Forests is within active livestock grazing allotments (figure 21 and figure 22). All permitted livestock grazing is for cattle, as the one sheep allotment was vacated in 2007. In FY 2020, 4,590 cow/calf pairs were permitted to graze the Forests at various times of the year, but largely from June 1st until September 30th, for a total of 29,861 animal unit months (table 36). Table 37 summarizes active allotment acres, livestock numbers, and animal unit months by grazing allotment by subbasin. Beginning May 2024, the Cedar Allotment will become vacant, and the Musselshell Allotment will be administratively closed. Federally listed fish occupy streams within or adjacent to 24 out of 36 active allotments, approximately 67 percent of the allotments (table 39).

Table 36. Livestock grazing statistics for Nez Perce-Clearwater lands

Grazing Information	Number
Permitted Cattle Numbers[1]	4,590
Permitted Cattle Animal Unit Months Term (Active Allotments)	29,861
Grazing Permittees (Permit Entities)	34
Active Allotments	36
Active Allotment Acres	612,766
Vacant Allotments	9

[1] One cattle number is equal to 1 cow/calf pair or 1 steer or 1 bull; calves greater than 6 months old are counted as cattle

Data Source: Forest Service INFRA database, 2020; Nez Perce-Clearwater geographical information system data



*Beginning May 2024, the Cedar Allotment will become vacant and the Musselshell Allotment will be administratively closed.

Figure 21. Grazing allotments in the northwest part of the plan area

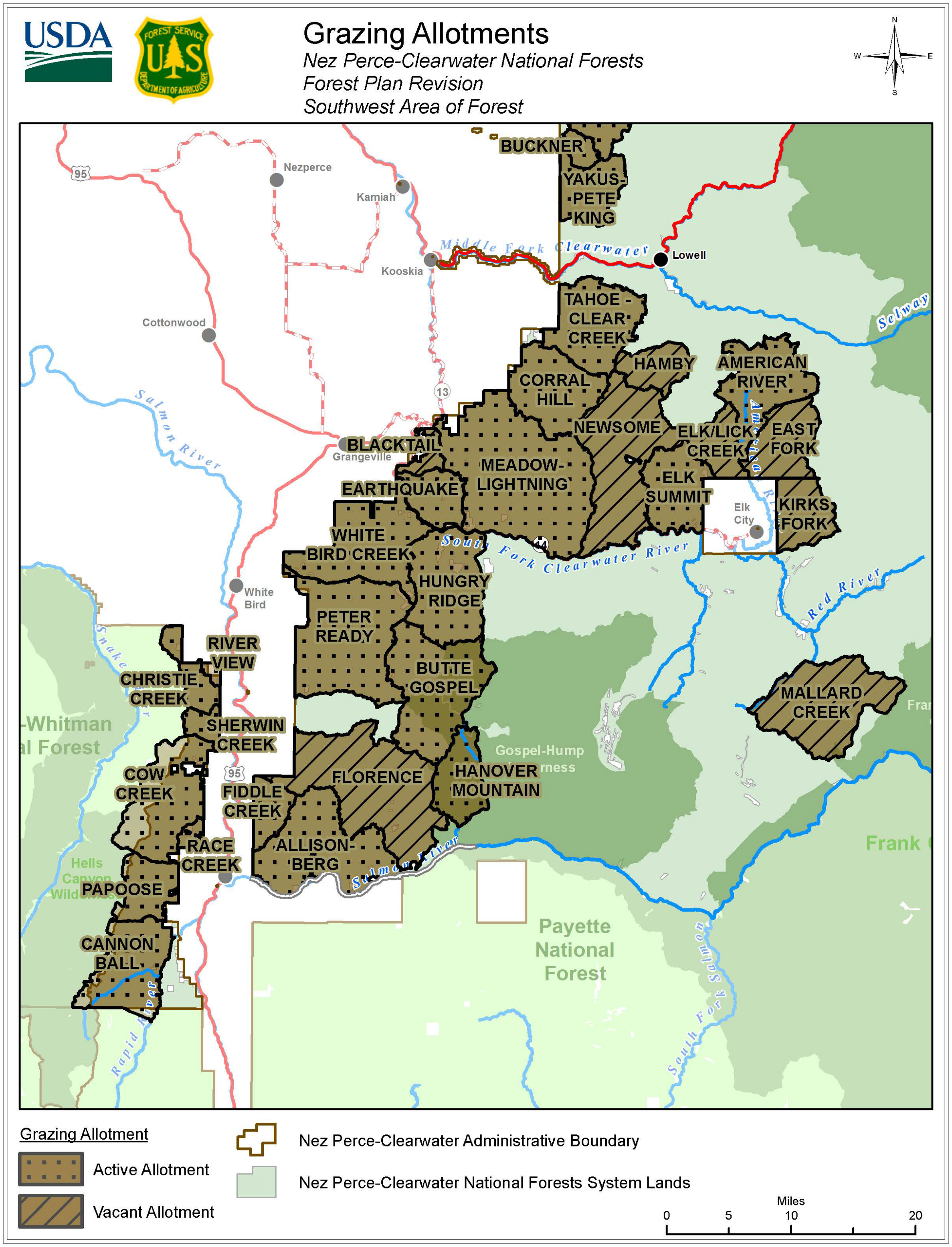


Figure 22. Grazing allotments in the southwest portion of the planning area

Table 37. Summary of active allotment acres, livestock numbers, and animal unit months by grazing allotment by subbasin

Allotment Name	Subbasin(s)	Total Allotment Acres	Allotment Acres on Nez Perce-Clearwater Lands	Livestock Numbers	Permitted Animal Unit Months
Buckner	Clearwater	4,054	4,054	25	132
Cedar[2]	Clearwater	12,834	12,834	48	254
Dan Lee Meadows	Clearwater	22,029	1,531	23	152
Musselshell[3]	Clearwater	9,708	9,703	90	475
Yakus-Pete King	Clearwater, Middle Fork Clearwater, Lochsa	14,594	14,594	65	343
Corral Hill	Middle Fork Clearwater, South Fork Clearwater	24,929	24,929	125	851
Tahoe - Clear Creek	Middle Fork Clearwater, South Fork Clearwater, Lower Selway	26,975	26,975	70	591
Camas-Jerome Creek[1]	Palouse	3,519	2,716	20	120
Corral Creek[1]	Clearwater	13,185	8,747	246	1633
East Fork Bear Creek[1]	Clearwater, Palouse	7,529	3,798	35	210
East Fork Corral Creek[1]	Clearwater	2,653	444	25	166
Gold Creek[1]	Hangman, Palouse	6,951	6,951	25	166
Mount Margaret[1]	Clearwater, Palouse	9,753	7,859	17	114
Potlatch Creek	Clearwater, Lower North Fork Clearwater	17,763	14,026	161	1,069
Purdue Creek	Clearwater	3,235	2,335	12	73
Round Meadows	Clearwater, Lower North Fork Clearwater	34,486	7,404	75	433
Upper Palouse[1]	Clearwater, Palouse	36,362	35,530	11	66
West Fork Potlatch - Moose Creek	Clearwater, Palouse	26,404	21,045	188	1,249
American River	South Fork Clearwater, Lower Selway	24,977	24,977	115	546
Elk Summit	South Fork Clearwater	19,306	19,306	100	806
Allison-Berg	Lower Salmon	37,359	37,359	60	479
Butte Gospel	South Fork Clearwater, Lower Salmon, Middle Salmon-Chamberlain	38,895	38,895	215	766
Cannon Ball	Little Salmon	25,583	21,796	170	1,145
Christie Creek[1]	Lower Salmon	8,232	8,112	173	1,156
Cow Creek	Lower Salmon	29524	18,556	599	4,847
Earthquake	South Fork Clearwater	11,928	11,928	185	1,148
Fiddle Creek[1]	Lower Salmon	8,477	8,477	100	405
Hanover Mountain	Lower Salmon, Middle Salmon-Chamberlain	15,473	15,473	145	293
Hungry Ridge	South Fork Clearwater, Lower Salmon	31,505	31,505	210	1,386

Allotment Name	Subbasin(s)	Total Allotment Acres	Allotment Acres on Nez Perce-Clearwater Lands	Livestock Numbers	Permitted Animal Unit Months
Meadow-Lightning	South Fork Clearwater, Middle Fork Clearwater	70,340	70,340	234	1,720
Papoose	Little Salmon, Lower Salmon	13,156	12,189	160	1,233
Peter Ready	South Fork Clearwater, Lower Salmon	47,552	47,363	368	2,627
Race Creek[1]	Lower Salmon	2,350	2,350	35	234
Riverview[1]	Lower Salmon	1,274	628	11	22
Sherwin Creek[1]	Lower Salmon	4,512	4,498	49	393
White Bird Creek	South Fork Clearwater, Lower Salmon	33,539	33,539	400	2,558
Total	Empty cell	700,945	612,766	4,590	29,861

[1]Allotments do not contain streams with Endangered Species Act listed fish

[2]Cedar Allotment will become vacant in May 2024

[3]Musselshell Allotment will be administratively closed in May 2024

Data Source: Forest Service INFRA database, 2020; Nez Perce-Clearwater geographical information system data

Direction in the current Forest Plan as modified by PACFISH/ INFISH has standards and guidelines that protect or minimize effects to listed fish from livestock grazing include modifying grazing practices, locating new facilities outside of RHCAs, relocating or closing facilities, and limiting livestock handling efforts (PACFISH/INFISH GM-1, 2, and 3). Components, such as FW-STD-ARGRZ-01, FW-STD-ARGRZ-02, FW-GDL-ARGRZ-02, FW-GDL-ARGRZ-03 in the proposed action mostly carry forward and expand upon current standards and guidelines.

Streams with lower gradients (primarily less than 3 percent) are the most sensitive to grazing impacts (Rosgen 1996). Proposed guideline FW-GDL-ARGRZ-01 establishes minimum end of season stubble heights of 10 to 15 centimeters (4 to 6 inches) along the greenline for low gradient streams. Alternative use and disturbance indicators and values may be used if they are based on site capability, relevant science, monitoring data, and meet the purpose of this guideline. Stubble height is a meaningful and relatively easily determined metric related to riparian vegetation and has been found to correlate with instream habitat quality (Roper 2020), and has been widely utilized as an end-of-season monitoring indicator ((U.S. Department of Agriculture 2022)). End of season stubble height (greenline vegetation height) has been shown to be a good indicator of two primary factors: 1) the effect of grazing on the physiological health of herbaceous, hydrophytic plants, and 2) the ability of the vegetation to provide streambank protection and bank building function. Stubble height criteria should be used where streambank stability is dependent upon herbaceous plants. Clary and Webster (1990) recommended that in the Intermountain West, a minimum stubble height of approximately 10 to 15 centimeters should remain at the end of the grazing season to maintain plant vigor and provide for bank protection and for sediments to be deposited. However, 19-20 centimeters stubble height was the optimal length to retain sediment deposits (Abt et al. 1994, Thornton et al. 1997). Similarly, Clary and Leininger (2000) indicated that 15-20 centimeters stubble height would be necessary to protect willow and vulnerable streambanks. Clary (1999) found that 10 centimeters protected most of the stream attributes while 14.1 cm was needed to protect all stream attributes. Higher average stubble height at the end of season is more likely to provide plants with enough growth during the season to retain vigor in the following season (Clary 1995, Boyd and Svejcar 2012). While height at the end of the growing season still needs more study, some have found positive relationships between higher stubble height at the end of the season and stream habitat conditions (Goss 2013).

Table 29 displays the current stubble height objectives directed in annual operating instructions by allotment as established by specific allotment NEPA or allotment management plans. Of the 36 active allotments, 33 allotments have stubble height objectives between (4 and 6 inches). Three allotments have a stubble height objective of 65 percent utilization. These allotment specific stubble height objectives would be retained until new objectives are established through site specific NEPA, as guided by FW-GDL-ARGRZ-01.

As shown in table 38, there are approximately 416 miles of streams of low gradient streams (based on average of three percent gradient) that occur within active allotments, about 15 percent of the total stream miles within active livestock grazing allotments.

Table 38. Number of stream miles less than and greater than three percent gradient by allotment

Allotment Name	Stream Miles with Gradient Less Than 3 Percent	Stream Miles with Gradient Greater Than 3 Percent
Buckner	5.5	14.1
Cedar[2]	19.2	27.7
Dan Lee Meadows	46.6	26.4
Musselshell[3]	17.9	12.6
Yakus-Pete King	3.4	46.4
Corral Hill	2.9	94.8
Tahoe - Clear Creek	0.7	77.8
Camas-Jerome Creek[1]	1.1	15.7
Corral Creek[1]	36.3	83.6
East Fork Bear Creek[1]	7.5	53.7
East Fork Corral Creek[1]	6.1	7.5
Gold Creek[1]	2.7	25.8
Mount Margaret[1]	3.1	39.6
Potlatch Creek	31.9	77.6
Purdue Creek	2.3	20.6
Round Meadows	35.2	113.8
Upper Palouse[1]	25.3	121.6
West Fork Potlatch - Moose Creek	51.1	111.4
American River	10.0	77.8
Elk Summit	14.3	82.3
Allison-Berg	12.4	143.7
Butte Gospel	8.8	76.0
Cannon Ball	6.7	83.9
Christie Creek[1]	0.0	26.4
Cow Creek	0.2	171.1
Earthquake	10.5	35.9
Fiddle Creek[1]	0.0	22.9
Hanover Mountain	1.7	52.5
Hungry Ridge	15.9	94.6

Allotment Name	Stream Miles with Gradient Less Than 3 Percent	Stream Miles with Gradient Greater Than 3 Percent
Meadow-Lightning	18.0	275.5
Papoose	0.1	43.3
Peter Ready	10.5	156.3
Race Creek[1]	0.0	9.1
Riverview[1]	0.0	6.0
Sherwin Creek[1]	0.1	19.9
White Bird Creek	7.7	88.4
Total	415.8	2,436.3

[1]Allotments do not contain streams with Endangered Species Act listed fish
[2]Cedar Allotment will become vacant in May 2024
[3]Musselshell Allotment will be administratively closed in May 2024

Twenty of 36 active livestock grazing allotments are located within watersheds included in the CWN table 39. In addition to standards and guidelines limiting activities that could cause damage to the riparian area, the "do not retard" clause in FW-STD-CWN-01 also applies. This standard is very similar to existing PACFISH standard GM1, both of which require modification of grazing practices which retards or adversely affect listed anadromous fish.

Proposed standard FW-STD-ARGR-03 states during livestock grazing authorizations, re-authorizations, or updates to annual operating instructions, measures should be included to prevent livestock trampling of fish redds of federally-listed fish and species of conservation concern. This standard is a partial refinement of grazing standards in PACFISH/INFISH. As shown in Table 37, federally listed fish occur in 24 out of 36 allotments, approximately 67 percent of allotments. This standard has been implemented on the Nez Perce-Clearwater for federally-listed fish species since consultation with the U.S. Fish and Wildlife Service and NOAA Fisheries Service in 1999 and 2000. Mitigation measures have been identified and implemented to protect salmon and steelhead redds from livestock trampling according to the agreements in the Forest Service Biological Assessments and concurrence documents from NOAA Fisheries Service. Annual operating instructions for those allotments containing streams with federally listed species provide specific direction and mitigation measures for protection of redds. These measures include identifying redd locations through redd surveys by Forest Service fisheries biologists. If fish redds are identified, mitigation measures, such as changing the date for livestock entry into a pasture containing active spawning, installing temporary or permanent fencing of identified redds or areas of redd concentrations, or use of herding by the grazing permittee to keep cattle away from spawning areas would be implemented. This standard would be applied through the life of the plan to the same degree as was applied at the time of consultation with NOAA Fisheries Service. Implementation of proposed plan direction would continue to move resource conditions within allotments toward desired conditions.

Table 39. Presence of Endangered Species Act Fish within streams located within livestock grazing allotments

Allotment Name	Bull trout	Steelhead	Spring/Summer Chinook (Salmon River)	Fall Chinook	Sockeye
Buckner	present	present	not present	not present	not present
Cedar[1, 2]	present	present	not present	not present	not present
Dan Lee Meadows	not present	present	not present	not present	not present
Musselshell[1, 3]	present	present	not present	not present	not present

Allotment Name	Bull trout	Steelhead	Spring/Summer Chinook (Salmon River)	Fall Chinook	Sockeye
Yakus-Pete King	not present	present	not present	not present	not present
Corral Hill	present	present	not present	not present	not present
Tahoe - Clear Creek[1]	present	present	not present	not present	not present
Camas - Jerome Creek	not present	not present	not present	not present	not present
Corral Creek[1]	not present	not present	not present	not present	not present
East Fork Bear Creek	not present	not present	not present	not present	not present
East Fork Corral Creek[1]	not present	not present	not present	not present	not present
Gold Creek	not present	not present	not present	not present	not present
Mount Margaret	not present	not present	not present	not present	not present
Potlatch Creek[1]	not present	present	not present	not present	not present
Purdue Creek	not present	present	not present	not present	not present
Round Meadows	present	not present	not present	not present	not present
Upper Palouse	not present	not present	not present	not present	not present
WF Potlatch - Moose Creek[1]	not present	present	not present	not present	not present
American River[1]	present	present	not present	not present	not present
Elk Summit[1]	present	present	not present	not present	not present
Allison-Berg[1]	present	present	present	present	present
Butte Gospel[1]	present	present	present	not present	not present
Cannon Ball[1]	present	present	not present	not present	not present
Christie Creek	not present	not present	not present	not present	not present
Cow Creek	present	present	not present	not present	not present
Earthquake[1]	present	present	not present	not present	not present
Fiddle Creek	not present	not present	not present	not present	not present
Hanover Mountain[1]	present	present	present	not present	not present
Hungry Ridge[1]	present	present	not present	not present	not present
Meadow-Lightning[1]	present	present	not present	not present	not present
Papoose[1]	not present	present	not present	not present	not present
Peter Ready[1]	present	present	present	not present	not present
Race Creek	not present	not present	not present	not present	not present
Riverview	not present	not present	not present	not present	not present
Sherwin Creek	not present	not present	not present	not present	not present
White Bird Creek[1]	not present	present	present	not present	not present

[1]Allotment located within a Conservation Watershed Network (CWN)
[2]Cedar Allotment will become vacant in May 2024
[3]Musselshell Allotment will be administratively closed in May 2024
Data Source: Fish distribution spatial data was obtained from Pacific States Marine Fisheries Commission (PSMFC) Stream Net website, http://www.streamnet.org, version 01/31/2019.

The revised forest plan updates PACFISH/INFISH components and adds additional components to address site-specific adverse effects that could occur. Additionally, project-specific best management practices (BMPs), including both federal and state BMPs, shall be incorporated into project planning as a principal mechanism for controlling non-point pollution sources, to meet water quality desired conditions, and to protect beneficial uses (FW-STD-WTR-02). Best management practices for livestock grazing management can be found in the Soil and Water Conservation Practices handbook (U.S. Department of Agriculture 1988) and the National Best Management Practices for Water Quality Management on National Forest System Lands Technical Guide (U.S. Department of Agriculture 2012b). Controlling livestock distribution within a pasture or allotment, adjusting season of use to maintain and protect soil and water resources, and moving livestock when prescribed utilization levels are reached are a few examples of best management practices.

Overall, RMZ conditions in grazing allotments are expected to be maintained where they currently meet desired conditions, and improve where they do not. When degraded conditions are documented at specific sites (ex. Clearwater bank stability), particularly those related to PBFs 1, 4, 5, 6 and 8, changes to annual operating instructions would be given to guide attainment of desired conditions. Steadily improving riparian conditions in grazing allotments would be expected to contribute to improvements in instream habitat to the benefit of the species addressed in this BA.

Recreation

Desired conditions include a minimal recreation footprint on aquatic habitat including the species and critical habitat addressed in this BA (FW-DC-ARREC-01). Two streamside dispersed recreation sites would be targeted for improvements or relocations every 5 years (FW-OBJ-ARREC-01). New developed recreation facilities would be kept out of floodplains or within 100 feet of water where feasible (FW-GDL-ARREC-01) to help protect riparian and instream conditions. Guidelines related to trail design, construction, and maintenance aim to prevent or minimize aquatic impacts (FW-GDL-ARREC-02-06).

Revised plan components aim to minimize and prevent background levels of riparian disturbance and streambank impacts caused by the recreation program. Over time, impacts to critical habitat from existing recreation sites would be mitigated, through project specific measures to reduce impacts or relocation or closure of the site altogether. Additionally, new recreation sites would not be approved if they caused adverse effects to water quality or aquatic resources (FW-GDL-ARREC-02). Localized effects to riparian vegetation, streambanks, woody debris, and water quality could still occur where heavy recreational use occurs and at some popular established recreation sites. FW-OBJ-ARREC-01 is aimed at reducing the impacts of these popular sites by mitigating, removing, or relocating two sites every 5 years, though impacts would still continue to occur until a project is proposed to address them. Adverse effects could therefore occur to PBF 4 and PBF 8.

Lands and Special Uses

Effects under the revised plan would be expected to be the same as under the current plan. Effects to critical habitat from special uses would generally arise from occupation and use of RMZs, and the general effects of soil compaction, stream bank disturbance, and effects to riparian vegetation (PBF 4). Existing special use permits were consulted on when salmon, steelhead, and bull trout were listed under the Endangered Species Act, or had site/permit-specific consultation, if appropriate. The primary revised standard for protecting Federally listed aquatic resources, FW-STD-ARLND-01, states that: “When authorizing new lands special uses, or reauthorizing existing uses, include conditions to avoid or minimize adverse effects to fish, water, and riparian resources. If adverse effects are unavoidable to Endangered Species Act listed fish, species of conservation concern, impaired water bodies, or stream habitat conditions, authorizations shall require actions that result in the re-establishment, restoration, mitigation, or improvement of conditions and ecological processes to ensure that projects that degrade conditions also include measures to improve conditions to the extent practicable. These processes include in-stream flow regimes, physical and biological connectivity, water quality, and integrity and complexity of riparian and aquatic habitat.” A standard and guideline would also apply to new and existing hydropower facilities (FW-STD-ARLND-02, FW-GDL-ARLND-01). The potential and degree of risk to listed fish and critical habitat by lands and special uses are generally low and any specific actions would be subsequently reviewed on an individual basis with the revised standard (FW-STD-ARLND-01) as the basis for evaluation.

Watershed Restoration

The revised forest plan must incorporate watershed restoration direction from multiple sources which can give the appearance of conflicting restoration priorities. It can therefore be helpful to consider where and when each of the three primary sets of watershed restoration direction applies. The first set of watershed restoration direction are the water (WTR) plan components. These include twelve desired conditions and five objectives that are all forest-wide (FW) components such that they would apply to all future management actions regardless of which watershed or what other type of status may also be applicable (priority watershed, conservation watershed network, etc.). These WTR plan components are grounded in the 2012 planning rule that requires "the plan must include plan components, including standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area…" (U.S. Department of Agriculture 2012c).

The second set of watershed restoration direction is the requirement for forest plans to identify priority watersheds as part of the watershed condition framework (WCF). The WCF was designed in 2011 to establish a nationally consistent method for evaluating watersheds and provide a comprehensive approach for proactively implementing integrated restoration on priority watersheds on national forests and grasslands (U.S. Department of Agriculture 2011a); use of this national strategy in all forest plan revisions is also a requirement of the 2012 Planning Rule. A watershed restoration action plan (WRAP) must be completed for every watershed identified as a priority watershed under the WCF program that specifically identifies restoration actions needed to improve the overall watershed rating. The scope of the WCF program is broad and encompasses all Forest Service activities that contribute to improved watershed condition, including soil and water improvements, vegetation management, invasive species treatment, range management, wildlife and fisheries habitat restoration, road improvements, road decommissioning, and other activities. The intent is to utilize a holistic approach to treat whole subwatersheds from "ridge-top to ridge-top" to improve overall watershed condition.

The Nez Perce-Clearwater has completed three WRAPs to date (Fishing Creek, Upper Newsome Creek, and Meadow Creek) and is currently working on implementing WRAPs in three additional watersheds (Upper Elk Creek, Upper Clear Creek, and Upper Little Slate Creek), and developing WRAPs in two additional watersheds, (Musselshell Creek and Lower Crooked River).

The Musselshell Creek priority watershed (HUC12 # 170603060202) is located in the Clearwater River Subbasin. The watershed is rated as Class 2 – Functioning at Risk. The watershed contains the Musselshell Meadow Restoration project and portions of the Lolo Insect and Disease project. A watershed restoration action plan is cooperatively being developed with the Nez Perce Tribe and other partners. Essential projects include vegetation management for forest health and resiliency, fuels treatment, invasive species treatment, meadow restoration, road reconstruction, road decommissioning, soil rehabilitation, instream habitat improvement, and riparian area restoration.

The Lower Crooked River priority watershed (HUC12 # 170603050302) is located in the South Fork Clearwater River Subbasin. It is rated as Class 3 – Impaired, primarily due to concerns with water quality and aquatic habitat and road-related issues. The watershed contains the Crooked River Valley Rehabilitation project and portions of the Orogrande Community Protection project. A watershed restoration action plan is cooperatively being developed with the Nez Perce Tribe and other partners. Essential projects include extensive re-meandering of approximately 3 miles of Crooked River, riparian planting, removal of historic mine tailings that are disrupting channel function, wetland rehabilitation, Road 233 reconstruction above the 50-year flood flow elevation, road improvement, recreation site relocation and restoration, post-wildfire rehabilitation, invasive species treatment, vegetation management for forest health and resiliency, fuels treatment, and prescribed fire.

The Agricultural Improvement Act of 2018 (2018) authorized national forests to have up to five priority watersheds identified at any given time (U.S. Department of Agriculture 2018a). Under the revised forest plan, the Forest would evaluate and identify priority watersheds based on the need for restoration to improve overall watershed condition; alignment with other strategic objectives or priorities at the National, Regional, or local level; alignment with priorities of other agencies and potential partners, and in consideration of available funding sources for potential WRAP actions. These watersheds would generally be the highest priority watersheds for focusing active restoration efforts as resources become available to meet the desired outcome of FW-OBJ-WTR-01: "Complete the actions identified in watershed restoration action plans for 15 priority watersheds as identified under the WCF process every 15 years." Priority watersheds may or may not overlap geographically with the conservation watershed network.

The third set of watershed restoration direction is the conservation watershed network (CWN). PACFISH/INFISH originally called watersheds meant to focus on restoring native fish habitat 'priority watersheds', but since that term was adopted by the WCF, the watersheds identified for emphasis on native fish are now called CWN watersheds in the revised plan to continue to meet the intent of PACFISH/INFISH direction (see Conservation Watershed Network section above and Appendix C. Conservation Watershed Network Watersheds for additional details). At a minimum, restoration in CWN watersheds would become a priority when they happen to be located in the action area of future integrated projects; but they could become an overall priority if CWN watersheds are also designated as a WCF priority watershed.

Watershed condition framework Priority Watersheds can best be thought of as tactical and near-term designations guiding the implementation of agency work priorities in the near-term (i.e., 5-year program of work), whereas Conservation Watersheds are more strategic and long-term designations helping to provide conditions that maintain or restore habitat for aquatic species in highly dynamic environments over the duration of a land management plan.

Under the revised forest plan, watershed restoration projects will promote the long-term ecological integrity of aquatic ecosystems (FW-DC-WTR-12, FW-GL-WTR-04). Priority watersheds identified at the time of the revised plan include Upper Elk Creek, Upper Clear Creek, and Upper Little Slate Creek, Musselshell Creek, and Lower Crooked River. Additions to the priority list are expected to occur over the life of the plan as decided by a forest or area responsible official using a multi-functional interdisciplinary approach that includes tools such as the Watershed Condition Framework, alignment with agency restoration policies, strategies, and priorities, and alignment with partner strategies, policies and priorities, as well as collaborative efforts. Watershed Condition Framework currently requires the development of watershed restoration action plans (WRAPs) with the object to "complete the actions identified in watershed restoration action plans for 15 priority watersheds as identified under the Watershed Condition Framework process every 15 years" (FW-OBJ-WTR-01). Beyond this specific "priority" list, watersheds in the CWN would have high priority for restoration (FW-OBJ-CWN-01).

Short-term effects of implementing instream project elements are generally harmful to PBFs and listed species because plumes of suspended sediment can be created and/or individual fish can be injured/killed during construction; Dewatering project sites can also strand young-of-the-year fish. Fuel or hydraulic fluid leaks from heavy equipment can contaminate soil and streams. Equipment access points and/or work in riparian areas (e.g., AOP installation) can locally disturb stream beds, banks, and surrounding vegetation.

However, long-term effects of implementing instream project elements are generally beneficial to PBFs and listed species because instream habitat and habitat forming processes are restored though these types of projects. Properly mitigated temporary negative effects are therefore dramatically out-weighed by permanent long-term beneficial effects. For example, imposing new patterns of scour and deposition by installing instream habitat structures can redistribute existing spawning gravels. Installing instream wood can supplement local wood and gravel supplies, create or improve spawning and rearing habitat, and buy time for riparian treatments to have the desired effect of restoring natural channel forming processes. AOPs restore connectivity within watersheds, making more spawning and rearing habitat and temperature refugia available to listed fish as well as allowing hydrologic connectivity by conveying bed materials down the stream network (FW-DC-WTR-02). Much of this work would be accomplished through partnerships (FW-GL-WTR-02).

The revised plan aims to support functionally intact watersheds and critical habitat and thereby support native aquatic communities including listed fish (FW-DC-WTR-01/03/10). The plan includes specific targets of restoring 50 to 100 miles of unconfined stream channels (FW-OBJ-WTR-02) and 5 miles of confined channels (FW-OBJ-WTR-03) every five years. The Riparian Management Zone definition (FW-STD-RMZ-01) and the associated objective FW-OBJ-RMZ-02 to improve riparian habitat aim to facilitate instream habitat improvement projects on the forests. FW-STD-RMZ-01 was written in such a way as to specifically allow projects whose sole objective is to improve aquatic and riparian associated resources within the nearest 100 feet to the active stream channel. Outside the nearest 100 feet (an additional 200 feet in fish bearing streams), allow projects to benefit aquatic and riparian resources as well as to address fuel loading and silvicultural desired conditions provided it can be demonstrated (through multiscale analysis) that the project would not negatively impact the important functions of the outer area which include sediment filtering and large woody debris requirement. No commercial timber harvest may occur within the RMZ. While connectivity has been restored in many parts of the forest, new AOPs would aim to reconnect 10 to 20 miles of habitat every 5 years (FW-OBJ-WTR-04). Each of these restoration actions allowed and encouraged by the plan may have short term adverse effects to critical habitat followed by long term beneficial effects.

Proposed RMZ guidance would create opportunities for vegetation management to underplant native tree species in riparian areas, for example, that would move RMZs towards desired conditions of reference-like habitat in terms of their species diversity and structural complexity. Ecoregion-appropriate riparian stands would benefit instream habitats and the listed fishes that utilize them as the riparian, instream, and biological processes of interest evolved coincidently and are therefore dependent on each other.

Proposed projects completed under the revised forest plan would undergo reviews via NEPA, Endangered Species Act, Magnussen-Stevens, and by the Army Corps of Engineers. Short-term and local adverse impacts to critical habitat would occur as restoration projects are implemented. PBF 8, which is sensitive to stream-bank or bed disturbance, could be adversely affected during project implementation but would be expected to quickly recover, within hours to days. Ultimately, all PBFs would benefit from restoration work.

Effects to Listed Species

Salmonids that inhabit similar systems and have similar habitat requirements (i.e., cold water, clean gravels, connected systems, and complex habitat) are likely to experience effects from management actions in similar fashion. This is particularly valid in the context of programmatic actions at the scale of a revised forest plan where no direct on-the-ground actions are proposed. This section therefore analyzes indirect effects of proposed actions to all listed aquatic species together just as the preceding section analyzed critical habitat PBFs for multiple species together.

Indirect Effects of Proposed Actions

Management area allocation changes would be beneficial or neutral long-term for Federally listed aquatic species in the action area. A primary beneficial change occurs from an increase in recommended wilderness by over 60,000 acres (Table 4). Resulting wilderness acres would be unsuitable for several activity types that otherwise could adversely affect listed species (e.g., permanent road building) and constrain others (e.g., timber production); Refer to MA2-SUIT-RWILD plan components for complete suitability direction for recommended wilderness.

While MA2 lands would increase from wilderness designation, they also shrink by 22,658 acres that are converted to MA3 lands. The shift from MA2 to MA3 lands results from proposing fewer rivers for wild and scenic status. The current number of rivers eligible for wild and scenic river designation would decrease from 29 under the 1987 forest plans to 12 under the proposed plan (11 suitable and one eligible). Most of the rivers that would lose eligibility are located in otherwise protected land allocations (e.g., Designated wilderness, Idaho Roadless Rule, etc.). Portions of six rivers are located in areas that were previously managed for multiple use under previous forest plans, but the quarter-mile protection corridors were classified as MA2 for FEIS analysis purposes, based on the similarity between Wild and Scenic River protections and MA2 suitability. The changes in land allocation from MA2 to MA3 reflect removal of the quarter mile protection corridors from river segments otherwise in MA3 that will lose eligibility. For a more thorough discussion of the complexities associated with these land allocation comparisons, see the discussion under the Eligible and Suitable Wild and Scenic Rivers section in the Effects of the proposed action of the Grizzly Bear analysis).

Most stream and riparian protections would not be compromised by changing allocation from MA2 to MA3 because the current quarter-mile protection corridors (cumulatively equates to the 22,658 acres that would change from MA2 to MA3) afforded by the National Wild and Scenic Rivers System Act is larger than necessary to protect nearly all stream functions. With the change to MA3, stream and riparian processes formerly protected by the corridor will still be maintained by proposed RMZ distances and numerous plan components that protect stream processes and are designed to move riparian habitat toward desired conditions. For example, RMZ plan components such as FW-DC-RMZ-01, 02 provide guidance for management activities to re-establish disturbance patterns in areas where it is lacking. While RMZs will protect nearly all stream functions, roads can be built, and if necessary, can cross through RMZs, which could have short-term adverse effects. Even if a crossing were to occur, plan components that restrict activities retarding attainment of desired conditions would be effective in preventing or minimizing long-term adverse effects.

The revised forest plan, through ROS, only identifies areas suitable and not suitable for motorized recreation. Current conditions, opened/closed, remain in place until a travel management decision is made. Identifying areas for suitability of motorized and non-motorized access proposals has the potential to adversely affect listed species because lands suitable for motorized use are proposed to increase (pending likely future travel management decisions) for both summer (45 percent to 55 percent) and winter (39 percent to 60 percent; table 5); Roads and trails that support motorized use can cause sedimentation and large woody debris issues if not hydrologically disconnected. However, proposed standards and guidelines are expected to mitigate these effects. For example, FW-STD-ARINF-01 says: “Road maintenance and new road construction shall be designed to minimize adverse effects to threatened, endangered, proposed, or candidate aquatic species and their habitat,” and FW-GDL-ARREC-02 says: “To reduce potential adverse effects to water quality and aquatic resources, construction of new facilities or infrastructure within floodplains should be avoided. Where new activities inherently must occur in riparian management zones (e.g., at road and trail stream crossings, boat ramps, or docks), they should be located and designed to minimize adverse effects to floodplains and other riparian-dependent resource conditions (e.g., within geologically stable areas and avoiding major spawning areas)." These standards and guidelines would be expected to ensure that if adverse effects to listed species were to occur in the future as the result of these motorized access suitability proposals, they would be minor and not preclude species' recovery to a non-listed status.

Aquatic and riparian management strategies in the proposed forest plan would be beneficial for Federally listed species as several RMZ and CWN plan components were specifically designed to maintain the intent of PACFISH/INFISH direction (e.g., FW-RMZ-STD-07; Appendix E); the same direction that was largely responsible for passive restoration and upward trend in habitat conditions documented by the PIBO program. But unlike the focus on passive restoration under the 1987 forest plans, the revised forest plan includes components that also emphasize active restoration. For example, FW-OBJ-RMZ-01 says: "Improve 300 to 700 acres of riparian habitat every 5 years, through improvements that are intended to meet desired conditions for riparian management zones, such as road obliteration, riparian planting, hardwood restoration, post assisted log structures, beaver dam analogs, and reconnecting floodplains by removing road prisms or berms." This increased capacity for active restoration has the potential to have long-term beneficial effects to all listed species. Identifying inner and outer zones of RMZs that clearly allow for active restoration to occur where desired conditions are not currently being met as opposed to PACFISH/INFISH that was often interpreted as 'exclusion zones' or areas that were not readily available for active management.

Indirect effects of proposed actions such as the monitoring program, potential management approaches, and other plan content would also be beneficial for listed species as these elements are designed to facilitate implementation of the new forest plan. And because the net effect of most other proposed actions as described above are beneficial, proposals to evaluate progress towards meeting desired conditions and engage in partnerships, establish priority watersheds, etc. would likewise have beneficial effects all listed species.

The net effect of actions under the revised forest plan is one that promotes recovery of listed fish through a combination of passive and active management, while allowing actions with short-term adverse effects. Adverse effects are not expected to hinder progress of critical habitat or listed fish toward recovery due to the management constraints imposed by plan components that protect fish and critical habitat. The primary reason for this is the inclusion of desired conditions that identify what future projects would be designed to achieve. For example, projects in watersheds that contain listed species would have to "contribute to and enhance the conservation of aquatic species of conservation concern and recovery of threatened or endangered fish species" (FW-DC-CWN-01); "provide habitat that supports robust native fish populations, which are able to expand to and recolonize adjacent unoccupied habitats" (FW-DC-CWN-02); and ensure "critical habitat components (primary biological features) provide the ecological conditions necessary to achieve species recovery. Spawning, rearing, and migratory habitat are widely available and inhabited. Listed aquatic species have access to historic habitat and appropriate life history strategies (e.g., bull trout resident, fluvial, adfluvial, and anadromy) are supported" (FW-DC-WTR-10). It is important to note that while some plan components could temporarily have adverse effects to listed species (e.g., FW-OBJ-TBR-01: Offer 190-210 million board feet timber per year.), those components would have to been implemented in a way that does not compromise the above-mentioned desired conditions.

Management of Activities Likely to Occur

Refer to Management of Activities Likely to Occur under the Effects to Critical Habitat and Essential Fish Habitat section above to see how revised plan components would guide future actions. Specific effects to listed species from those actions would be analyzed via project-specific section 7 consultation.

Cumulative Effects

Cumulative effects for this programmatic analysis will focus on how effects from on-going or future state, tribal, or private land management direction could overlap in time and space with proposed action effects; past effects are part of the baseline and future Federal effects would undergo section 7 consultation. This section therefore analyzes consistency of management plans on adjoining lands with the revised forest plan, as well as the potential effects of climate change.

State of Idaho

The State of Idaho manages some land that primarily borders the northwest portion of the action area. Idaho also retains management jurisdiction over water bodies within the action area and over the fish themselves. Idaho Department of Fish and Game (IDFG) therefore manages fisheries resources and must consider constituents' desired uses which includes support and protections for native species. For example, one of the Statewide Fisheries Management Principles states that: "Native populations of resident and anadromous fish species will receive priority consideration in management programs" (Idaho Department of Fish and Game 2019). This management strategy is fairly similar to forest plan direction in that both must ensure the viability of listed species while still providing opportunities for multiple land/resource uses. Idaho Department of Water Resources (IDWR) manages all other instream water actions through Stream Channel Protection Program that requires a permit for any actions that would alter a stream channel, where 'alter' is defined as "any activity that will obstruct, diminish, destroy, alter, modify, relocate or change the natural existing shape or direction of water flow of any stream channel" (Idaho Department of Water Resources 1998).

Nez Perce Tribe

The Nez Perce Tribe is a leader in recovery of listed aquatic species through their fisheries department, including their production, research, and watershed divisions. In particular, the fisheries department has a comprehensive management plan (Nez Perce Tribe Department of Fisheries Resources Management 2013) and shares a mission to -protect and restore aquatic resources and habitats on the Nez Perce-Clearwater National Forests and beyond. The Tribe leverages funds from multiple sources and accomplishes large scale projects to improve aquatic habitat and riparian conditions annually. This work is expected to continue into the future. In addition, the Nez Perce Tribe fisheries department operates three mitigation hatcheries (Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, and the Nez Perce Tribal Hatchery) that release Spring/Summer Chinook, Steelhead, Coho, and Fall Chinook into rivers on the forest in order to provide for sport and tribal harvest. The Tribal management plans take a "ridgetop to ridgetop" philosophy in their approach to restoration that is similar in scale to the landscape scale focus of the revised forest plan.

Northwest Power and Conservation

The Northwest Power and Conservation Council (NPCC) was established in 1980 by the states of Idaho, Montana, Oregon, and Washington in accordance with the US Congress' passage of the Northwest Electric Power and Planning Act (Northwest Power Act, [Northwest Power Act, §2 (1-6), 94 Stat. 2698.] (94 Stat. 2698, 16 USC §839). The Act authorized the Council to serve as a comprehensive planning agency for energy policy and fish and wildlife policy in the Columbia River Basin and to inform the public about energy and fish and wildlife issues and involve the public in decision-making (Northwest Power and Conservation Council 2022). This is accomplished by implementation of the Columbia River Basin Fish and Wildlife Program, which currently directs approximately 250 million dollars annually of US Department of Energy-Bonneville Power Administration revenues to projects designed to protect and enhance fish and wildlife that have been affected by hydropower dams in the Columbia Basin (Northwest Power and Conservation Council 2022). Current priorities identified by the program include climate change impacts, mitigation for losses of anadromous fish, studying ocean environments, operation of Libby and Hungry Horse Dams in Montana to benefit resident and anadromous fish, and studying impacts to the Columbia River Estuary (Northwest Power and Conservation Council 2022). Northwest Power Conservation Council's Fish and Wildlife Program provides most of the funding for fisheries and wildlife and aquatic and terrestrial habitat work in the pacific northwest, including aquatic restoration work that is done on the Forest. The NPCC Fish and Wildlife Program and the revised forest plan are complementary in the focus on restoring habitat for ESA listed fishes. In addition, NPCC's current (2014 with 2020 amendments) fish and wildlife plan recommends "protected areas" wherein the Federal Energy Commission (FERC) not license any new hydropower facilities in areas where hydroelectric development would have unacceptable risks of loss to fish and wildlife species of concern, their productive capacity, or their habitat. Northwest Power Conservation Council's list of protected areas covers the entire forest and most of the Pacific Northwest.

Private and/or commercial landowners

Private landowners, both small family holdings and larger commercial landowners are not required to develop long term management plans. However, there are sizable tax incentives offered by the state of Idaho for having a 50-year forest management plan written by a certified forester. Without a mandate to aid in recovery, they are only required to not take of listed species or their habitat. The Idaho Forest Practices Act and Clean Water Act do apply to private (both small family and corporate) landowners and the State of Idaho and is the primary mechanism by which aquatic and riparian habitat is maintained. The Idaho Department of Lands monitors compliance with the Idaho Forest Practices Act and associated Best Management Practices on private, corporate, and state land, and cumulative compliance over the past 5 years has been approximately 99% (Morrow et al. 2021). It is assumed that in general at a large scale these landowners will continue to operate similarly as they have in the past.

Climate Change

General climate change effects on fish

Predicting what effects future climatic changes may have on fish relies on complex climate change models. One of the difficulties associated with anadromous fish like salmon and steelhead, and highly migratory fish like bull trout, is understanding how climate affects all the habitats that the fish use during different portions of their life. In addition, climatic effects are expected to be different for various fish species, and effects that are detrimental to one species may be beneficial to another (Lynch et al. 2016). This section is not intended to be an exhaustive review or analysis of climate science. However, it is important to highlight some of the effects expected to occur on fish that rely on habitat within the boundaries of the forest. Climate modeling has suggested four general effects that are likely to occur relating to streams on the forest. These are more of the annual precipitation will be rain, there will be less snowpack, there will be higher and earlier peak flows, and stream temperatures will rise (Crozier and Zabel 2006, Northwest Power and Conservation Council et al. 2007, Bisson et al. 2008, Isaak et al. 2012a, Williams et al. 2015). These effects are likely to directly and indirectly affect multiple PCE/PBF's, especially those related to flow and temperature (5, 7, 9). Most models of climate effects on fish make predictions at multiple temporal scales, with various target years as well (2080, 2090, etc.), but since the forest plan is intended to guide management for the next 15 years, the 20 to 40-year predictions are most relevant to this particular document. Climate vulnerability assessments that account for a species' exposure, sensitivity, and adaptive capacity are more robust (Wade et al. 2016;2017) and are given preference in this section. A recent climate change vulnerability assessment from NOAA Fisheries characterized all ESU and DPS groups of salmon and steelhead in the coterminous western US based on both the population's vulnerability (exposure and sensitivity) to climate change, as well as it's adaptive capacity, or resilience (Crozier et al. 2019a).

Bull Trout

Bull trout require the coldest water of any of the listed fishes on the forest. This is especially true for embryos and juveniles (Isaak et al. 2017). For this reason alone, they are thought to be highly sensitive to changes in climate. However, they also express multiple life history strategies on the Forest that may increase population resilience. Isaak et al. (2012b) observed that although they have suffered range contraction in many locales (Eby et al. 2014), no populations have yet gone extinct due to climate change. Many of the streams on the forest have been identified as strongholds for bull trout, where populations have been documented as stable or increasing (High et al. 2008, Erhardt and Scarnecchia 2014, Meyer et al. 2014, Isaak et al. 2015, Isaak et al. 2022). This is in part due to the high-quality habitat available on the forest, as well as the life history variation expressed in these populations. Bull trout in streams on the forest can exhibit three different life history strategies including resident, adfluvial, and fluvial. Resident fish remain in headwater streams for their entire lives, which can provide genetic insurance against downstream catastrophic disturbance events. Adfluvial bull trout on the forest live in the cold, deep water of Dworshak Reservoir and migrate up the North Fork Clearwater to headwater streams to spawn. Erhardt and Scarnecchia (2014) found that this population had increased in the eight years from 2000 to 2008, and predicted that by 2019 it would likely pass the USFWS recovery goal of 5,000 adults. Abundance data for validation of this prediction is still being analyzed. Fluvial bull trout live in large mainstem rivers like the Snake and Clearwater and undergo seasonal migrations to headwater streams to spawn. All of these life history forms can be found together on spawning grounds, and the subsequent genetic exchange adds to population resilience of bull trout on the forest. Isaak et al. (2015) predicted areas of cold-water refugia that would be the most important factor in bull trout persistence in the northern Rocky Mountains, and recently proposed a strategy (Isaak et al. 2022) to target restoration efforts in these stronghold areas, which comprised from five to 21 percent of habitat, but 72 to 89 percent of occupied habitat. Falke et al. (2015) assessed climate change vulnerability of bull trout in the Wenatchee basin in Washington (which, like the forest is a fire prone landscape) and found that fuels management and addressing connectivity could mitigate for climate vulnerability of bull trout in that landscape. Most of the headwater stream reaches on the forest are found in MA1 (roadless, wilderness, etc.) and the only management that would be occurring there is allowing wildland fire to burn.

Spring/Summer Chinook

Crozier et al. (2021) modeled life cycle climate effects on the Snake River Spring/Summer ESU and predicted up to an 18 percent decline in survival during the freshwater stage by 2060. This prediction is similar to that of Tonina et al. (2022), who predicted a 20 percent reduction in rearing habitat for spring Chinook in the Salmon River basin, and up to a 23 percent reduction in spawning habitat by 2040. Because Spring Chinook are anadromous, and spend most of their life in marine environments, climate effects on marine survival cannot be overlooked, and help to add perspective to discussions of freshwater effects. NOAA Fisheries' life cycle model Crozier et al. (2021) predicted a much larger decline (83-90 percent) during the marine stage by 2060, primarily driven by a rise is sea surface temperature. Although most of the projected population effects of climate on this spring Chinook ESU will occur in the marine environment, there are few mitigation options available there. As a result, freshwater mitigation efforts such as protecting and restoring stream habitat may become more important to population resilience. This

ESU of spring Chinook scored very high in vulnerability, but high in adaptive capacity during the recent climate change vulnerability assessment (Crozier et al. 2019a).

Fall Chinook

Fall Chinook life history takes place largely downstream of the forest boundary, however climate effects that occur on the forest will likely impact those downstream areas. Connor et al. (2019) modeled climatic effects on the Snake River fall Chinook ESU and noted that indirect effects of flow and temperature on migration and rearing would likely reduce reproductive success by up to 30 percent but noted that hypolimnetic water releases from storage reservoirs could become increasingly important in temperature mitigation. In particular, they predicted that releases of cold water from Dworshak dam into the Clearwater River could concentrate reproduction success in that area and perhaps mitigate for losses in other river sections where cold water releases are not available. This ESU of fall Chinook scored high in both vulnerability and adaptive capacity during the recent climate change vulnerability assessment (Crozier et al. 2019a).

Steelhead

Steelhead, like spring Chinook, utilize streams on the forest for extended (multi-year) juvenile rearing, as well as adult migration and spawning. Steelhead, unlike spring Chinook, are very widely distributed throughout the forest, from mainstem rivers to headwater streams. They exhibit a wide range of life history variation, from resident fish that never leave headwaters, to fish that rear in freshwater for 1-5 years (most commonly two to three) before exhibiting anadromy (Copeland et al. 2017). The prolonged and diverse use of habitat on the forest, combined with a high degree of adaptability, makes it difficult to predict climate effects on steelhead. Steelhead that occur on the forest are classified as summer steelhead, meaning that adults migrate upstream to spawn primarily in August and September. Many of these fish hold over fall and winter in larger mainstem rivers and reservoirs in the system before completing migration to natal areas during winter and spring and spawning in April and May National Oceanic and Atmospheric Administration, 2021. Even before impoundment of the Snake and Columbia Rivers, river reaches in the adult migration corridor commonly exceeded critical temperature thresholds (20° C) in summer (National Oceanic and Atmospheric Administration 2017), which may have created thermal barriers to migrating adults during summer months. In addition, base flows in some stream reaches drop to levels creating passage barriers that can impede adult migration. Much of the steelhead spawning and rearing habitat on the forest is prone to wildfire during the late summer months. Adult steelhead behaviorally mitigate for warm migration temperatures by use of cold water refugia during summer for extended periods (Hess et al. 2016, Keefer et al. 2018). Strategies such as holding in mainstem habitats or other pockets of refugia until stream temperatures drop and flows increase and potential fires are extinguished by seasonal weather patterns, or straying to other suitable spawning locales, are adaptations developed over millennia and provide an evolutionary advantage in a landscape historically characterized and shaped by frequent natural disturbance. A wide range of phenotypic and behavioral plasticity, and a wider thermal tolerance (Spina 2007, Sloat and Osterback 2013) and migration ability has enabled steelhead to persist over a much larger geographical area than Chinook on the forest. (Wade et al. 2012) conducted one of the first landscape scale climate vulnerability assessments on steelhead in the pacific northwest (PNW). They concluded that the most severe climatic effects would be seen in steelhead at the southern extant of their range, with a subsequent range shift northward, and concluded maintaining connectivity across the entire PNW would provide more of a buffer to climate effects than local-scale habitat restoration. The ESA recovery plan notes the current and potential future importance of seasonal cold hypolimnetic releases from hydropower projects in both the Snake and Clearwater basins, which maintain connectivity during summer months and may partially mitigate for more frequent temperature exceedance that is likely to occur under climate change (National Oceanic and Atmospheric Administration 2017). There is a high degree of uncertainty involved in assessment of net effects to a highly adaptable fish like steelhead. Using optimal temperature modeling, Zhang et al. (2019) predicted that steelhead survival rates in the Snake River basin are expected to increase by more than 10 percent by 2080 due to mean river temperature increasing into the optimal range for steelhead growth. Wade et al. (2016) predicted that population groups on the forest would be less vulnerable to climate impacts than population groups within the DPS at lower elevations. This DPS scored high in vulnerability and moderate in adaptive capacity during the recent climate change vulnerability assessment (Crozier et al. 2019a).

Sockeye

Although most of the life history of Snake River sockeye take place outside of the forest boundaries, a portion of the migration corridor for adults and juveniles (mainstem Salmon River) forms the southern border of the forest. Sockeye are critically endangered and particularly vulnerable to extinction based on their life history. Adult sockeye migrate up to natal areas during the hottest part of the summer, and lower snowpack could exacerbate in-river temperatures. In 2015, a large portion of the adult run died in the Columbia River due to record high temperatures and low flows in the basin encountered during their spawning migration. Crozier et al. (2020) projected that changes in temperature and flow that affect sockeye would be greatest in the free-flowing mainstem Salmon River. They predicted an 80 percent decrease in adults surviving upstream migration by year 2040 under current climate predictions. There is likely little that can be done within the boundaries of the forest to mitigate for this. The ESA Recovery Plan (National Oceanic and Atmospheric Administration 2015) identifies coordinated management actions that need to occur and the agencies responsible for implementation, (Table 7.1, National Oceanic and Atmospheric Administration 2015), but all of the identified actions take place outside the Nez Perce-Clearwater National Forests boundaries. If future temperature and flow regimes approach what was observed in 2015, continued failure of spawning migrations could be expected unless there is “coordinated management throughout the migration corridor” (Crozier et al. 2020). An example of the type of mitigation action needed was cited by Crozier et al. (Crozier et al. 2020): in 2015, some fish were saved by Idaho Fish and Game transporting them via truck from Lower Granite dam to the hatchery, however transportation from Bonneville Dam would have likely been more effective because many fish died before reaching Lower Granite. This ESU scored very high in vulnerability and low in adaptive capacity during the recent climate change vulnerability assessment (Crozier et al. 2019a).

Overall

The revised forest plan establishes plan components that continue, and in some cases exceed the protection afforded by PACFISH/INFISH (Appendix E. Crosswalk of Standards and Guidelines Between PACFISH/INFISH and the Land Management Plan Aquatic Ecosystem Plan Components). These plan components are also intended to maintain physical and biological features (PBFs) (Appendix F. Physical and Biological Features Crosswalk Table). It is the intent of these plan components to continue to protect and enhance freshwater spawning and rearing habitat relating to future activities on the forest. In addition, the philosophical basis for management changes under the new plan, as activities on the forest are intended to consider the natural range of variation (NRV) and move conditions at the landscape scale toward a set of desired conditions within the scope of NRV. Bisson et al. (2009) noted that restorative actions would be more “likely to foster salmon resilience if they consider processes that generate and maintain natural variability in freshwater.” In the face of climate challenges, cultivating population resilience will likely play a larger role in the continued persistence of threatened fish species on the forest.

Climate change is already occurring on the Nez Perce-Clearwater National Forest and throughout the western United States, and it is expected to continue to affect listed fish species and their distributions. In the abstract to a study focused on the effects of climate change on Pacific salmon and steelhead, Crozier et al. (Crozier et al. 2019b) state, “Major ecological realignments are already occurring in response to climate change." This study goes on to document how salmonid species will likely be affected in future years, including the probability that extinctions will occur at the edges of species ranges and in locations where adaptive capacity is lacking.

In recognition of climate change, the plan revision has focused attention on ways to increase resilience of aquatic ecosystems. The authors in Gaines et al. ((Gaines et al. 2022)) suggest several actions that can minimize the effects of climate change on riverine ecosystems : "…minimizing stream water withdrawals and diversions, re-connecting floodplains, re-aggrading incised channels, restoring riparian shade, protecting or restoring beaver populations, reducing chronic sediment from roads, reducing non-native species invasions, restoring fire regimes to re-engage hillslope processes, and implementing a program of monitoring and adaptive management."

The Plan contains components that address these recommendations in multiple ways. Some examples include components that guide collaboration with partners (FW-GL-WTR-03, FW-GL-TE-02), restore passage to streams (FW-STD-ARINF-06), prevent impacts to aquatic environment from roads (FW-DC-ARINF-01), restore landscape vegetation conditions in response to climate change and fire (FW-DC-FOR-02, MA1 and MA2-DC-FOR-06, DC-FOR-02, FW-DC-FIRE-01), restore beaver habitat (FW-OBJ-WTR-02, FW-GL-WTR-03, FW-OBJ-RMZ-01) and protect ecological processes next to streams by restricting management to ensure activities protect and restore riparian function (stream protection categories 1, 2, and 3). Other examples include protecting large woody debris in streams (FW-GDL-WTR-01), protecting stream flows (FW-DC-WTR-07), managing invasive species (FW-GDL-INV-02), and restoring riparian cover, floodplain connectivity, and hardwoods when lacking (FW-OBJ-RMZ-01).

The Northern Rockies Adaptation Partnership (NRAP) is a science-management partnership consisting of 15 national forests in the Northern Region of the USFS, three national parks, USFS Rocky Mountain Research Stations, University of Washington, and numerous stakeholders. They published a volume in 2018 (Halofsky and Peterson 2018) identifying climate change issues relevant to resource management in the Northern Rocky Mountains and discussing solutions that minimize negative effects of climate change and facilitate transition of diverse ecosystems to a warmer climate. They included recommendations and adaptation options for a wide range of resources on the forests, including water resources and infrastructure, fisheries, forest vegetation, rangeland vegetation, wildlife, and recreation. It was intended that (Halofsky et al. 2018b)and (Halofsky et al. 2018c) would guide and assist adaptation for climate effects throughout the region at the project level, and potential climate adaptation strategies developed through NRAP helped in the development of plan components.

Climate adaptation strategies recommended by (Halofsky et al. 2018b) Halofsky et al. 2018 focus on effects of climate induced changes in two primary ways with regard to aquatic organisms, addressing expected changes in hydrology, as well as expected threats to cold water fishes and aquatic organisms. These strategies address hydrologic changes by focusing on restoring the function of watersheds, connecting floodplains, reducing drainage efficiency, maximizing valley storage, and reducing hazardous fuels. Adaptation tactics include adding wood to streams, restoring beaver populations, modifying livestock management, and reducing surface fuels and forest stand densities. Potential strategies for infrastructure include increasing the resilience of stream crossings, culverts, and bridges to higher peak flows and facilitating response to higher peakflows by reducing the road system and disconnecting roads from streams. Potential adaptation tactics identified by NRAP include completing geospatial databases for infrastructure and drainage components, installing higher capacity culverts, and decommissioning roads or converting them to alternative uses.

Climate adaptation strategies recommended by Halofsky's team that could be used to address climate change threats to cold water fish species include maintaining or restoring functionality of channels and floodplains to retain water, hence cooling the water, and buffering against future changes; decreasing fragmentation of stream networks so aquatic organisms can reach similar habitats; and developing wildland fire plans that incorporate BMP's to reduce sediment inputs and road failures. Adaptation tactics could include using multiscale analysis to develop integrated actions for vegetation and hydrology, protecting groundwater and springs, restoring riparian areas and beaver populations to maintain summer baseflows, reconnecting and increasing off-channel habitat and refugia, identifying and improving stream crossings that impede fish movement, decreasing road connectivity, and revegetating burned areas to store sediment and maintain channel geomorphology. Removing nonnative fish species and reducing their access to cold water habitat reduces competition with native fish species.

The following are specific examples of forest plan components that support potential climate adaptation strategies developed by Halofsky et al. (Halofsky et al. 2018b), as well as the specific plan components that will help sustain the fundamental ecological functioning of aquatic and riparian resources.

How plan components support NRAP Climate adaptation strategies:

Build resilience to changing climate, higher peak flows, and higher variability: In the revised forest plan, the plan components associated with watershed (WTR) and riparian management zones (RMZ) address this strategy, specifically plan components FW-DC-WTR-07, FW-DC-WTR-08, FW-DC-WTR-11, FW-DC-RMZ-01, FW-DC-RMZ-02, FW-GDL-WTR-02, FW-GDL-RMZ-01, FW-GDL-ARINF-08, FW-GDL-ARREC-01, FW-GDL-ARREC-02, FW-OBJ-WTR-02, and FW-OBJ-RMZ-01. The strategy is addressed by maintaining the capability of floodplains and riparian areas.

Build resilience to higher stream peak flows: In the revised forest plan, the plan components FW-DC-ARINF-01, FW-STD-ARINF-04, FW-GDL-ARINF-05, FW-OBJ-WTR-02, FW-OBJ-CWN-02, FW-OBJ-ARREC-01, FW-OBJ-INF-02, and FW-OBJ-INF-03 and FW-DC-ARINF-02 address this strategy. The strategy is addressed by modifying infrastructure where possible; for example, increasing culvert size, improving road drainage, and relocating vulnerable campgrounds or road segments.

Respond to climate-induced occurrence of disturbances, such as drought and flooding: and wetlands are encompassed by riparian habitat conservation areas. In revised forest plan, wetlands are encompassed in riparian management zones, with specific plan components, such as FW-DC-WTR-02, FW-DC-WTR-08, FW-DC-WTR-09, FW-DC-RMZ-01, FW-DC-RMZ-02, FW-GDL-ARINF-08, and FW-OBJ-RMZ-01. The strategy is addressed by increasing water storage by recognizing the important ecological role of beavers and wetlands.

Reduce erosion potential to protect water quality: The revised plan supports this strategy based on adherence to the Healthy Forest Restoration Act. There are additional plan components, such as all forestlands (FOR) desired conditions related to forest densities, – FW-DC-FIRE-01, FW-OBJ-FIRE-01 , FW-OBJ-FIRE-02 , FW-OBJ-FIRE-03, FW-GDL-FIRE-01, FW-DC-MWTR-01, FW-STD-MWTR-01, FW-GDL-RMZ-02, FW-GDL-RMZ-06, FW-GDL-RMZ-07, FW-DC-ARINF-01, FW-STD-ARINF-03, FW-GDL-ARINF-01, FW-GDL-ARINF-03, FW-GDL-ARINF-04, FW-GDL-ARREC-03, FW-GDL-ARREC-04, FW-GDL-ARREC-05, FW-GDL-ARREC-06, FW-OBJ-INF-02, FW-OBJ-INF-03, and FW-OBJ-CWN-02. The strategy is addressed by reducing forest densities and fuel loadings in dry forest types to maintain low-to-mixed severity natural fire regimes reducing the risk of high-severity fire; and by using road and trail best management practices that reduce erosion; stormproofing roads; and prioritize prioritizing municipal water supplies.

Increase stream flows and moderate changes in instream flows: The revised plan incorporates this strategy based on the application of project-level best management practices (BMP's). The revised plan include plan components FW-DC-WTR-07, FW-DC-WTR-08, FW-GDL-WTR-06, FW-STD-CWN-03, and FW-STD-CWN-04. The strategy is addressed through securing and utilizing water rights for instream flows.

Increase habitat resilience for cold-water aquatic organisms by restoring structure and function of streams: The revised forest plan incorporates this strategy based on the application of project-level best management practices (FW-STD-WTR-02). Most plan components for water and aquatic resources (WTR), riparian management zones (RMZ), and conservation watershed networks (CWN) included in the action alternatives address this strategy, as well as plan components FW-DC-ARINF-01, FW-STD-ARINF-06, FW-GDL-ARINF-11, FW-OBJ-INF-01, and FW-OBJ-INF-02. The strategy is addressed through restoring natural channel and floodplain form and function; restoring aquatic organism passage structures through design and placement of appropriate structures; maintaining functional stream channel morphology; restoring riparian areas to increase hydrologic function and retain cold water; reintroducing beaver where beaver and management of westslope cutthroat trout are compatible; and removing or relocating roads adjacent to riparian areas, channels, and floodplains where they inhibit complexity.

Provide opportunities for native fish to move and find suitable stream temperatures: The revised forest plan incorporates this strategy based on the application of plan components (FW-STD-WTR-02). The revised forest plan includes plan components FW-DC-WTR-01, FW-DC-WTR-02, FW-DC-WTR-08, FW-DC-WTR-10, FW-DC-WTR-11, FW-DC-WTR-12, FW-OBJ-WTR-02, FW-OBJ-WTR-03, FW-DC-CWN-01, FW-DC-CWN-02, FW-DC-CWN-03, FW-STD-CWN-02, FW-STD-CWN-03, FW-OBJ-RMZ-01, FW-DC-ARINF-01, FW-STD-ARINF-06, FW-GDL-ARINF-11, FW-OBJ-INF-01, and FW-OBJ-INF-02. The strategy could also be addressed through increasing the patch size of favorable habitat to enhance viable populations and allow migratory life histories; modifying or removing barriers to increase connectivity between areas of cold-water habitat; and identifying and mapping where groundwater inputs provide cold water.

There are several components of the revised forest plan that will help to mitigate potential climate change effects on fish. Because healthy streams are most resilient to disturbances and better able to adapt to changing climates, they provide the best opportunity for continued persistence of ESA listed fishes on the forest. These adaptation strategies will be most beneficial if they are focused on maintaining and improving connectivity and restoring and protecting natural stream processes ((Bisson et al. 2009)). For example, one of these is the creation of the Conservation Watershed Network (CWN), which, among other things, identifies areas of cold water refugia that are likely to persist into the future. Knowing where these areas are will enable restoration actions to be focused on areas that will likely be increasingly important to cold water fishes in the future. Maintaining and improving connectivity of watersheds in the CWN will maximize the potential for genetic variability, thus allowing for natural selection of advantageous adaptations among listed fishes. In addition, the revised plan is built around a concept of promoting the restoration of natural landscapes and natural processes, and plan components that address these issues will cultivate population resilience. An example of this would be plan components that concern riparian areas will be beneficial by facilitating natural processes that slow evaporation, and provide shade and instream cover, and promote proper functioning of riparian areas. These are examples that attempt to illustrate the types of beneficial effects that plan components will have under the revised plan. The full benefit of the paradigm shift that underlies the revised forest plan lies in the fact instead of a past strategy of focusing on specific technical strategies to ameliorate local scale effects (Bisson et al. 2009), the focus is now on moving the entire landscape toward a more natural functioning system within the range of NRV. Instead of relying on individual components that only provide benefit to one resource area, the philosophy underling the components in the revised forest plan is the same for all resource areas. Virtually all the plan components are intended to maintain or increase resiliency to some degree. By focusing on protecting and maintaining natural streamflow processes and allowing for maximum genetic exchange through the maintenance of connectivity, the entire forest plan is designed to foster population resilience in ESA listed fishes.

All forest management activities that occur on the forest are subject to federal and state best management practices (BMPs). A detailed discussion of these is provided in FEIS Appendix K.

The use of an adaptive strategy that utilizes tools applying climate adaptation strategies, such as plan components, technical guidance found in documents like (Halofsky et al. 2018b;c)Halofsky et al. (2018), and national and state BMP's listed in appendix K of the FEIS will enable the forest to address the future challenges associated with climate change as they develop, with the flexibility need to stay relevant in the face of a developing threat.

Effect Determinations

This section synthesizes the information in preceding sections to substantiate an overall effect determination for each species and critical habitat listed by the Endangered Species Act and each essential fish habitat listed by the Magnuson-Stevens Act. Consideration is given to distribution within the action area to determine how likely a species is to experience effects, baseline conditions, potential duration and magnitude of project effects, and cumulative effects to provide a comprehensive evaluation of how Federally listed species might be affected by the revised forest plan.

Bull Trout and Critical Habitat

Almost all bull trout core areas in the action area have substantial portions of the watershed in either MA1 (wilderness) or MA2 (Idaho Roadless Areas), which have suitability components precluding future management actions, and this has kept habitat in near-reference condition and greatly reduces the risk of potential future project effects. Although most bull trout core areas are located in MA1 and MA2 management areas, and receive protection from suitability plan components, some bull trout habitat is found in MA3 management areas. Bull trout habitat found in streams in MA3 are subject to a higher level of potential risk from future project effects, because in MA3, suitability components generally do not preclude future actions that could adversely affect bull trout. However, most core areas in the action area are showing either stable or increasing trends such that they are serving as strongholds within the larger Mid-Columbia recovery unit. Only the South Fork Clearwater core area trend is inconclusive as discussed above. This trend data mirrors baseline conditions where those stable/increasing core areas are largely within MA1 or MA2 with habitat that is at or near reference condition. Conversely, PIBO results indicate the South Fork Clearwater has several habitat indicators that are departed from unmanaged systems. Indirect effects of proposed programmatic actions would be mostly beneficial for bull trout, however, the proposed expansion of the motorized access suitability (10% increase in summer; 21% increase in winter) could lead to adverse effects in the future. Proposed plan components are expected to provide enough guidance that future activities would not threaten stable/increasing core areas nor hinder recovery in the South Forth Clearwater core area, but some adverse effects to individuals of the species or PBFs would likely be unavoidable. It is the combination of uncertainty about the trend in a core area, partially degraded baseline, expanded suitability for motorized use, and plan components that cannot completely prevent adverse effects to individuals that warrants a **May Affect, Likely to Adversely Affect** determination for bull trout and bull trout critical habitat Table 40.

Snake River Steelhead Trout and Critical Habitat

Anadromous steelhead migrate in the mainstem corridors of the Snake River (up to Hells Canyon Dam) and Clearwater system rivers (up to Dworshak Dam in the North Fork Clearwater River). They spawn and rear in most subbasin tributaries where much of the production occurs in intermittent streams. This life history trait makes steelhead sensitive to management actions that could affect summer baseflows, pool formation, and floodplain inundation. As with bull trout, the risk of being affected is greatest for steelhead spawning streams in MA3. Recent biological viability assessments indicate the steelhead MPGs within the action area are either ‘maintained’, ‘viable’, or ‘highly viable’. Much of these trend data are related to habitat that is at or near reference condition (i.e., MA1 and MA2); however, the South Fork Clearwater aggregated stocks appear to have a stable ‘viable’ rating despite PIBO results that indicate several habitat indicators are departed from unmanaged systems. Indirect effects of proposed programmatic actions would be mostly beneficial for steelhead except for the proposed expansion of the motorized access suitability (10 percent increase in summer; 21 percent increase in winter) which could lead to adverse effects in the future. Proposed plan components are expected to provide enough guidance that future activities would not threaten stable/viable stocks, but some adverse effects to individuals of the species or PBFs would likely be unavoidable. Despite the stable/viable trend within the action area, the combination of partially degraded baseline, expanded suitability for motorized use, and plan components that cannot completely prevent adverse effects to individuals that warrants a **May Affect, Likely to Adversely Affect** determination for Snake River steelhead trout and steelhead trout critical habitat (Table 40).

Snake River Spring/Summer Chinook Salmon, Critical Habitat, Essential Fish Habitat

Listed Spring/summer chinook salmon migrate in the mainstem corridors of the Snake River (up to Hells Canyon Dam) and Salmon River. They spawn and rear in many of the same subbasin tributaries as steelhead although not quite to the same extent; spring/summer chinook would also have a substantial amount of exposure to management actions. A biological viability assessment reported in 2022 (Ford 2022) that the Upper Salmon and South Fork Salmon river MPGs have a ‘high’ overall viability risk rating (Ford 2022). This is because despite improvements in abundance/productivity in several populations relative to the time of listing, most populations experienced sharp declines in abundance in the recent five-year period. This is thought to be related more to changing ocean conditions than from spawning/rearing habitat as PIBO reports show several watersheds in the action area are near reference condition (i.e., MA1 and MA2). Indirect effects of proposed programmatic actions would be mostly beneficial for spring/summer chinook except for the proposed expansion of the motorized access suitability (10 percent increase in summer; 21 percent increase in winter) which could lead to adverse effects in the future. Proposed plan components are expected to provide enough guidance that future activities would not hinder recovery of high-risk MPGs, but some adverse effects to individuals of the species or PBFs would likely be unavoidable. It is the combination of high-risk MPGs, partially degraded baseline, expanded suitability for motorized use, and plan components that cannot completely prevent adverse effects to individuals that warrants a **May Affect, Likely to Adversely Affect** determination for Snake River spring/summer chinook and their critical habitat, and a **May Adversely Affect** determination for spring/summer chinook essential fish habitat (Table 40).

Snake River Fall Chinook Salmon, Critical Habitat, Essential Fish Habitat

Fall chinook currently spawn primarily in the mainstem Snake River (below Hells Canyon Dam), and the lower Clearwater River (below the North Fork Clearwater, largely downstream of the action area. Because the vast majority of spawning takes place in larger mainstem rivers below and downstream of any potential forest management actions, fall chinook are at lower risk of being affected by proposed actions than bull trout, steelhead, or spring/summer chinook salmon, which utilize smaller stream habitat throughout the forest. The critical habitat designation is likewise located primarily at the western edge of the action area, although essential fish habitat includes entire watersheds upstream from mainstem rivers and therefore would have greater potential to be affected by the revised forest plan. Recent biological viability assessments indicate the overall status of Snake River fall-run chinook salmon has improved compared to the time of listing such that the single population in the ESU is currently meeting the criteria for an overall risk rating of ‘viable’ although the entire ESU is still not meeting recovery goals. Baseline conditions in the lower Clearwater subbasin are measurably departed from reference conditions according to PIBO data where median substrate size, pool tail fines, and observed/expected aquatic macroinvertebrate were all degraded; the bank stability indicator also shows a negative trend, Indirect effects of proposed programmatic actions would be mostly neutral because fall chinook and their critical habitat are generally restricted to mainstem rivers downstream of most forest management activities. Proposed plan components are expected to provide enough guidance that future activities would not threaten the population, but some adverse effects to individuals of the species or PBFs could be possible. Despite fall chinook’s viable trend near the action area, the combination of degraded baseline where they spawn and plan components that cannot completely prevent adverse effects to individuals warrants a **May Affect, Likely to Adversely Affect** determination for Snake River fall chinook and fall chinook critical habitat, and **May Adversely Affect** determination for essential fish habitat (Table 40).

Snake River Sockeye Salmon and Critical Habitat

Snake River sockeye salmon migrate from the ocean, up the Salmon River, passing through the forest on their way to natal, lacustrine habitats to spawn. There is no spawning or rearing habitat on the forest and the critical habitat in the Salmon River that forms the southern boundary of the action area is used for migration only. In terms of natural production, the Snake River sockeye salmon ESU remains at ‘extremely high risk’ and the viability of ESU has likely declined since the time of the prior review so that the extinction risk category remains ‘high’. The network of PIBO sites does not cover the Middle Salmon–Chamberlain subbasin but despite some minor degradation from isolated grazing and mining, the baseline condition is generally considered to be functioning appropriately because large portions of the watershed are either designated wilderness or roadless area. Indirect effects of proposed programmatic actions would be neutral because sockeye salmon and their critical habitat only skirt the edge of the action area. Furthermore, many of the Nez Perce-Clearwater tributaries to the Salmon River are within the Gospel Hump and Frank Church River of No Return wilderness/roadless areas such that land management designations and forest plan components are expected to guide management of future activities in a manner that would not threaten the population or even allow effects to exceed beyond insignificant or discountable levels. For these reasons, the appropriate effect determination is **May Affect, Not Likely to Adversely Affect** for Snake River sockeye salmon and their critical habitat (Table 40).

Coho Salmon

Coho salmon were historically present in the Clearwater basin but were officially declared extirpated in 1985. Coho have been reintroduced in some drainages on the Forest, but hatchery/reintroduced coho are not listed under the Endangered Species Act. The only Federally listed entity that requires an effects determination is therefore the essential fish habitat in the Clearwater and Selway watersheds. Indirect effects of proposed programmatic actions would be mostly beneficial for coho essential fish habitat except for the proposed expansion of the motorized access suitability (10 percent increase in summer; 21 percent increase in winter) which could lead to adverse effects in the future. Proposed plan components are expected to provide enough guidance that future activities would not cause adverse habitat modification, but some negative effects to habitat elements would likely be unavoidable. For this reason, the appropriate effects determination for coho salmon essential fish habitat is **May Adversely Affect** (Table 40).

Table 40. Summary of effect determinations for individuals and critical habitat listed under the Endangered Species Act (ESA) and essential fish habitat listed under the Magnuson-Stevens Act (MSA).

Species	Listing Status	Individuals (ESA)	Critical Habitat (ESA)	Essential Fish Habitat (MSA)
Bull trout	Threatened	LAA	LAA	Not Applicable
Snake River Steelhead Trout	Threatened	LAA	LAA	Not Applicable
Snake River Spring/Summer Chinook Salmon	Threatened	LAA	LAA	MAA
Snake River Fall Chinook Salmon	Threatened	LAA	LAA	MAA
Snake River Sockeye Salmon	Endangered	NLAA	NLAA	Not Applicable
Hatchery Coho Salmon	Not Applicable	Not Applicable	Not Applicable	MAA

LAA = Likely to Adversely Affect
NLAA= Not likely to Adversely Affect
MAA= May Adversely Affect

Wildlife Species Assessment

Canada Lynx

Affected Environment

Canada lynx population ecology, biology, habitat descriptions, and relationships identified by research are described in detail in the literature cited. The following description of the affected environment provides a summary in the context of the northern Rocky Mountains, focusing on the Nez Perce-Clearwater National Forests and information that is necessary to understand the consequences of the proposed federal action.

Status and distribution

The lynx population in the Continental U.S. was listed as threatened in 2000, primarily due to a lack of adequate regulatory measures to conserve lynx habitat on federal lands at that time (U.S. Department of the Interior 2000a). In a recently completed 5-year review, the Fish and Wildlife Service concluded that the Canada lynx distinct population segment in the contiguous U.S. is "not in danger of extinction throughout all of its range or likely to become so in the foreseeable future… and recommend removing the Canada lynx DPS, currently listed as threatened, from the list of threatened and endangered species" (U.S. Department of the Interior 2017b).

The Canada lynx is a medium-sized forest carnivore that is strongly associated with its primary prey species, the snowshoe hare (*Lepus americanus*). Across their range, lynx typically occur in boreal and subalpine coniferous forests dominated by subalpine fir and spruce in landscapes with gentle topography (Squires et al. 2013). Engelmann spruce and subalpine fir tree species may also be found in other forest dominance types because they are shade tolerant and commonly occur in mid-and understory tree canopy layers with western larch, lodgepole pine, and/or Douglas fir in the overstory. Lodgepole pine has been found to be an important component of mixed conifer stands in lynx habitat (Holbrook et al. 2017a). Lodgepole pine is a fire adapted species that can dominate after wildfire. It can also be a component in mixed conifer stands.

Lynx have been documented to live up to 16 years in the wild (Kolbe and Squires 2006). Female lynx begin to reproduce at one to two years of age and can reproduce annually in good quality habitat with adequate prey. Canada lynx mate in March and April in the northern part of the range with kittens born from late April to mid-June (Koehler and Aubry 1994). In northwest Montana, litter sizes vary from one to five kittens per litter, with two or three kittens being the most frequently observed (Kosterman 2014). As reported in Olson et al. (2011), in Montana, female lynx stayed in natal dens on average for 21 ± 17 days, and subsequently used an average of 3 ± 2 maternal dens each year (Interagency Lynx Biology Team 2013). Kittens are left alone at den sites while the female lynx hunts, as noted by Slough (1999), Moen et al. (2008), and Olson et al. (2011) . Kittens remain with their mothers through their first winter until April to May when young disperse to establish their own home ranges (Mowat et al. 2000).

Across the Distinct Population segments (DPS) lynx populations, and individual lynx, are more likely to persist where competition, predation, and human-caused mortality (trapping and vehicle collisions are relatively lower (U.S. Department of the Interior 2017f). The most commonly reported causes of Canada lynx mortality are starvation, especially of kittens (Quinn and Parker 1987, Koehler 1990, Vashon et al. 2012). Human-caused mortality, including trapping and shooting, has been addressed in Ward and Krebs (1985), Bailey et al. (1986), and Moen (2008). Additionally, there may be increased energy output because of greater foraging effort, and potential exposure to predation, in landscapes where lynx may need to maintain large home ranges in landscapes where habitat patchiness leads to low hare densities (U.S. Department of the Interior 2017d). Predation on lynx by mountain lion, coyote, wolverine, gray wolf, fisher, and other lynx has been confirmed (Koehler et al. 1979, Poole 1994, Slough and Mowat 1996, O'Donoghue and Boutin 1997, Squires and Laurion 1999, Apps 2000, O'Donoghue et al. 2001, Vashon et al. 2012). Two of six mortalities of radio-collared lynx in Montana were due to mountain lion predation (Squires and Laurion 1999).

At southern latitudes, where lynx population density and productivity are lower than in the northern part of its range, harvest may be an additive source of mortality and lynx may be highly vulnerable to overexploitation (Koehler 1990). Aubry et al. (2000) hypothesized that human-caused mortality such as illegal or incidental harvest could significantly reduce lynx population numbers in southern regions. The state wildlife agencies have taken actions to reduce incidental or illegal trapping and shooting, which has reduced the potential for adverse cumulative impacts. Trapping and snaring of lynx is currently prohibited across the contiguous United States. Incidental trapping or snaring of lynx is possible in areas where regulated trapping for other species, such as wolverine, coyote, fox, fisher, marten, bobcat, and wolf, overlaps with lynx habitats (Squires and Laurion 1999). A trapped lynx can be released, but there is potential for accidental injury or mortality (Kolbe et al. 2003). State wildlife management agencies regulate the trapping of furbearers. In January 2016, the U.S. District Court ruled that the Idaho Department of Fish and Game propose a plan to conserve lynx within areas they are known to inhabit, notably the Panhandle and Clearwater regions in the northern part of the state. In January of 2018 the District Court reversed its 2016 decision based on additional information from the U.S. Fish and Wildlife Service and evidence of limited incidental captures.

Foraging and denning habitat are two factors of high importance to lynx populations (U.S. Department of Agriculture and U.S. Department of the Interior 2000). Winter is the most difficult time for lynx to find enough prey to survive. However, both the lynx and their primary prey (snowshoe hares) are highly adapted to survive where winters are long, and characterized by deep accumulations of soft, fluffy snow (Koehler and Aubry 1994). The lynx's long legs and large, furry feet make it well-adapted to travel across deep snow in pursuit of hares, thus affording a competitive advantage for hunting in wintery conditions over more generalist predators. Winter snowshoe hare habitat consists of places where young trees or shrubs grow densely and are tall enough to protrude above average snow depth, and where overhanging conifer boughs touch the snow surface. These conditions are most prevalent in young, advanced regeneration conifer stands as well as in older, multi-storied conifer stands. The summer diet of lynx may contain a broad range of alternate prey species in addition to snowshoe hares, such as other small mammals, birds, fish, and ungulates, including carrion (U.S. Department of Agriculture 2007d, Squires et al. 2010, Interagency Lynx Biology Team 2013). Since lynx and snowshoe hares are snow-adapted species with strong ties to boreal forest conditions, climate change could influence the availability of winter snowshoe hare habitat and associated lynx foraging habitat.

Research in northwest Montana where lynx are known to occur and snowshoe hares are relatively abundant indicates that it is not only the proportion of snowshoe hare habitat, but also the dominant tree species type, juxtaposition of early versus later successional habitat, and overall habitat connectivity that are important to lynx survival and reproduction (Holbrook et al. 2017a, Kosterman et al. 2018). It is important to note that the habitat structural classes referenced in these studies are not directly comparable with structural classes used to develop the Northern Rockies Lynx Management Direction. Holbrook et al. (2017a) indicated that lodgepole pine is also an important tree species for snowshoe hares, particularly in winter, because lodgepole pine produces higher levels of digestible protein than other conifer species, including spruce and subalpine fir. Spruce and subalpine fir and lodgepole pine often occur together in mixed conifer stands that are mapped as potential lynx habitat. This relationship of spruce/fir habitat and lynx appears to be largely driven by food availability, since the younger, regenerating forest supports the highest densities of snowshoe hares, but the mature forest structure is where lynx can hunt hares most efficiently. Lynx may also use a variety of boreal forest types in early- to mid-succession that lack dense horizontal cover required by snowshoe hares and the coarse, woody debris used for reproductive denning, but still provide adequate vegetative cover for lynx to travel through or rest in. These types include young to mature forests that result through natural succession as stands grow and lower branches are lost through the trees' self-pruning process, as well as mechanically thinned areas where tree spacing provides low horizontal cover for hares, and other harvest areas where dead and dying trees that would contribute to lynx denning habitat are removed for salvage or sanitation purposes. Lynx will travel through these areas when moving between patches of snowshoe hare habitat, or between foraging and denning habitat, and occasionally may find alternate prey species in these habitats (Squires et al. 2010) . Stands that currently have low horizontal cover and coarse woody debris have the potential to produce snowshoe hare habitat and/or denning habitat through disturbance and natural succession as young trees and shrubs fill gaps, trees die and fall to the ground, or through deliberate silvicultural management by opening the canopy to allow more light penetration to stimulate growth of grasses, forbs, shrubs and small trees in the understory (Zimmer et al. 2008, Holbrook et al. 2019).

Lynx denning habitat is characterized by large amounts of coarse woody debris (e.g., large, down logs and root wads from fallen trees), which can occur over a wide range of successional stages in forest habitat. Quality of denning habitat is influenced by proximity to foraging habitat, meaning the best quality denning habitat is where coarse woody debris is abundant within or adjacent to areas that provide habitat for snowshoe hares. The presence of coarse woody debris can be difficult to detect under a live forest canopy using remotely sensed imagery; however, due to recent large-scale ecological disturbance processes such as fire, wind, insects and disease, tree mortality has been widespread across the Nez Perce-Clearwater in recent years, and as a result, coarse woody debris is abundant and well distributed in lynx habitat, with equally abundant dead-standing trees available to contribute to coarse woody debris over time. Due to potential occurrence of coarse woody debris within a wide range of forest successional stages, lynx reproductive denning habitat is not modeled as a separate habitat component, but rather is assumed to be readily available and well distributed throughout lynx habitat on the Nez Perce-Clearwater National Forests.

Status of Lynx on the Forests

The Nez Perce-Clearwater National Forests lie within the Northern Rocky Mountain region of the contiguous distinct population segment (DPS) of Canada lynx and the U.S. Fish and Wildlife Service has identified that lynx "may be present" on both Forests.

The Recovery Outline for Canada Lynx (U.S. Department of the Interior 2005) categorizes lynx habitat in the continental U.S. as "core," "secondary," or "peripheral" based on historic and current occupation by lynx. Core areas have verified records of lynx presence over time and recent evidence of reproduction. Areas with historic records of lynx presence but no documentation of reproduction are identified as secondary areas, and peripheral areas are those with only sporadic detections of lynx (U.S. Department of the Interior 2005). Both the Nez Perce and Clearwater National Forests are considered secondary areas. The quality and quantity of habitat capable of supporting populations of snowshoe hares and lynx in secondary areas is questionable (U.S. Department of the Interior 2005). Therefore, secondary, and peripheral habitat contribute to lynx distribution and persistence by providing dispersal habitat to and from core areas, but otherwise, the role of these areas in sustaining lynx populations remains relatively unknown (Interagency Lynx Biology Team 2013).

An important distinction for applying the requirements of the Northern Rockies Lynx Management Direction is whether lynx habitat is currently designated as occupied per the 2006 Amended Conservation

Agreement and Northern Rockies Lynx Management Direction (U.S. Department of Agriculture 2007c;b). A Forest is considered 'occupied" when 1) there has been at least 2 verified lynx observations since 1999 on the National Forest unless they are verified to be transient individuals or 2) there is evidence of lynx reproduction on a National Forest (U.S. Department of Agriculture 2007c). Based on the best information available at the time of the Northern Rockies Lynx Management Direction, the Clearwater National Forest was, and continues to be, considered occupied while the Nez Perce National Forest is presently considered unoccupied. Although unoccupied areas, such as the Nez Perce NF portion of the Forest, may have occasional transient use by lynx traveling between more suitable areas, such use is believed to be rare.

Due to inconsistencies on the status of lynx presence or occupancy on the Nez Perce National Forest, the U.S. Fish and Wildlife Service informed the Forest "there is consensus that transient lynx may be present on the Nez Perce National Forest, at least occasionally" (U.S. Department of the Interior 2012).

The U.S. Fish and Wildlife Service referenced two pieces of information to come to this conclusion:

Ulizio et al. (2007) noted "historical sightings that may have been confirmed may be the result of transient lynx moving through the forest, but the infrequency of such reports suggests lynx are incidental to the area."

McKelvey et al. (2000) reported numerous verified historical records from Idaho County.

The letter also stated that "the issue of lynx occupancy on the NPNF [Nez Perce National Forest] is a separate but related matter that is not the focus of this letter and did not change the NPNF status as 'unoccupied'" (U.S. Department of the Interior 2012). While lynx have occasionally been sighted on the Forests, currently, little evidence exists of a resident lynx population or reproduction on the Nez Perce-Clearwater Forests. The U.S. Fish and Wildlife Service's 2014 reexamination of critical habitat for lynx concluded that the lands in the Nez Perce and Clearwater National Forests "were likely not occupied by lynx at the time of listing and are not currently occupied by lynx populations" (79 FR 54818 2014).

Specimen records of lynx in Idaho during the early 1900s are relatively common (Mills et al. 2000). Mills et al. (2000) reported 22 museum specimens of lynx from 1874 to 1917, all of which were collected north of the Snake River plain in Idaho. Thirteen other verified records prior to 1960 were also from the north central and northern regions of the state (Mills et al. 2000). There are 35 verified records from 1960 to 1991 with most coinciding with lynx irruptions in the 1970s. Given the lynx-specific survey work conducted on the Nez Perce National Forest and extensive surveys for other species using hair snares, snow track surveys, and camera stations conducted on the Clearwater National Forest, the presence of a population would be detected given the network of roads and trails. Historical sightings that have been confirmed may be the result of transient lynx moving through the Nez Perce-Clearwater, but the infrequency of such reports suggests that lynx are incidental to the area (Ulizio et al. 2007).

Table 41. History of surveys for lynx and other meso-carnivores on the Nez Perce-Clearwater National Forests

Year	Forest	Agency	Season	Survey	Target	Results	Report
1989-2003	Nez Perce	FS - NPCLW	Winter	Snow Track	Fisher and Marten	No Detection of lynx	Multiple
2004-2006	Both	IDFG	Winter	Snow Track	Multi-species	No Detection	Multiple
2007	Nez Perce	FS - RMRS	Winter	Snow Track	Lynx	No Detection	Ulizio et al, 2007
2008	Nez Perce	FS - NPCLW	Fall	Hair Snare	Lynx	No Detection	Bonn, 2008
2013	Nez Perce	FS - RMRS	Winter	Snow Track	Lynx	No Detection	Stone et al, 2013
2015	Nez Perce	FS - NPCLW	Winter	Snow Track and Camera Bait Stations	Lynx	No Detection	Snyder, 2015
2016	Both	IDFG	Winter	Camera Bait Stations	Wolverine	No Detection	Lukacs, 2020
2018	Both	FS - RMRS	Winter	Snow Track and Camera Bait Stations	Multi-species	No Detection	Lutes, 2019
2019	Both	IDFG	Summer	Un-baited Game Cameras	Wolf	No Detection	Not yet available
2019	Clearwater	FS - NPCLW	Winter	Snow Track eDNA	Fisher	No Detection	Not yet available
2019	Both	IDFG	Winter	Camera Bait Stations	Fisher	No Detection	Krohner, 2020
2021	Both	FS - RMRS	Winter	Snow Track eDNA	Lynx	In Progress	Not yet available

Low incidents of verified lynx records on the Nez Perce-Clearwater National Forests may reflect lynx habitat which provides only marginal conditions for long-term residential lynx occupation due to limited capability to support snowshoe hares. Holbrook (2019) indicates that a landscape which provides 50-60 percent mature forest and 18-19 percent regenerating forest (i.e., stand initiation hare habitat) provides a high-quality mosaic of habitat for female lynx. Current modelling estimates indicate that approximately 30 percent of lynx habitat on the Forest is in mature-multistory while 6.5 percent is in stand initiation hare habitat. Canada lynx persistence in boreal forests is dependent on a minimum threshold density that is estimated to be greater than 0.5 hares per ha, or that ranges from 1.1 to .8 hares per ha (Ellsworth and Reynolds 2006). Estimates of hare density range from 0.1 to 9.7 hares/10 hectare (.01 to .97 per hectare) across 6 study areas within the Clearwater National Forest (Wirsing and Murray 2002). Additionally, the snow in lynx habitats on the Nez Perce-Clearwater may have a higher water content and therefore subjected to more freezing and thawing than in the northern portion of lynx range. Crusting or compaction of snow may reduce the competitive advantage that lynx have in soft snow with their long legs and low-foot loadings (Ruggiero et al. 1999). At lower snow depths an increase in competition for prey occurs and there is an increase in potential predation on lynx (U.S. Department of the Interior 2017f).

In September 2014, the Fish and Wildlife Service designated revised critical habitat in Montana, Wyoming, Idaho, Washington, and other states (50 CFR Part 17, Volume 77 (No. 117), Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the

Canada Lynx and Revised Distinct Population Boundary; Final Rule). Critical habitat was not designated on the Nez Perce or Clearwater National Forests (74 FR pp. 8616–8702, (U.S. Department of the Interior 2009). On September 26, (2013c), the U.S. Fish and Wildlife Service published a proposed rule for revised critical habitat in the Federal Register. Still, no critical habitat has been designated on the Nez Perce-Clearwater National Forests.

Habitat Distribution and Status on the Forests

Habitat Mapping

In 2007, 18 national forest plans (including the Clearwater and Nez Perce forest plans) were amended to incorporate the Northern Rockies Lynx Management Direction. Appendix I. Lynx Mapping Section from Draft Forest Plan Assessment, in the Northern Rockies Lynx Management Direction Final Environmental Impact Statement (U.S. Department of Agriculture 2007d) includes a letter from the Lynx Biology Team to the Lynx Steering Committee that summarizes criteria for lynx habitat mapping and a 2000 review of mapping methods used by Forests within the Northern Rockies Geographic Area. The Lynx Biology Team determined that habitat mapped in 2000 within the Northern Rockies Geographic Area was consistent with established criteria and process. The area of lynx habitat modeled and mapped on the Forest in 2000 was 930,000 on the Clearwater National Forest and 810,000 acres on the Nez Perce National Forest (U.S. Department of Agriculture 2007a), Appendix J. Objectives, Standards, Guidelines, and Definitions found in the NRLMD Record of Decision, and is spatially displayed in figure 1-1 in the NRLMD FEIS.

The Northern Rockies Lynx Management Direction FEIS (p. 99) states that during site-specific project analysis, maps of lynx habitat would be reviewed and updated based on local information and that future plan amendments or revisions may also consider lynx and information about local lynx presence as appropriate. The Service, in their 2007 Biological Opinion on the Northern Rockies Lynx Management Direction (U.S. Department of the Interior 2007b), also recognized and expected that lynx habitat maps would be refined and improved as new information and refined GIS mapping techniques became available (p. 4). The Canada Lynx Conservation and Strategy (Interagency Lynx Biology Team 2013) encourages updating maps where new information and vegetation databases will improve identification of lynx habitat (p. 87). Thus, guidance for updating lynx habitat maps on lands managed by the Forest Service is well documented and encouraged when new information is available to inform improved and more accurate mapping of lynx habitat.

In 2014, as part of the forest plan revision process, and in conjunction with the U.S. Fish and Wildlife Service and Regional Office, Forestwide lynx habitat and Lynx Analysis Unit (LAU) mapping was revised to develop consistent mapping criteria across both Forests (which were now administratively combined) and to include the best available scientific information concerning lynx population dynamics, distribution, habitat use, competitor interactions, prey species, and human interactions that had become available since 2007. The LCAS (2000) and Interagency Lynx Biology Team (2013) recommended that mapping of primary habitat should be based on forest types necessary to support lynx survival and reproduction specific to each geographic area. In northern and central Idaho this consists of subalpine fir, Engelmann spruce, and lodgepole pine potential vegetation types (Interagency Lynx Biology Team 2013). The mapping process for lynx analysis units and potential habitat is summarized below, a more detailed description of the process can be found in Appendix I. Lynx Mapping Section from Draft Forest Plan Assessment of this BA.

In (2021) Olson and others developed a refined model of lynx habitat across the northwestern United States using environmental predictors and GPS data from lynx populations in Washington, Montana, and Wyoming. This model indicates high relative probability of lynx habitat on the Idaho and Montana sides of the Lolo Pass area, south of Powell in the Wind Lakes/Kooskookia Meadows/Elk Summit Area. This habitat model is currently under review for use as a habitat analysis and management tool within the Northern Region. If adopted, lynx analysis unit boundaries may be re-delineated to better line up with the new model.

Mapping Lynx Analysis Units

The LCAS (2000) indicated that Lynx Analysis Units (LAUs) should be developed and used to map lynx habitat, determine habitat conditions, and assess management effects to lynx. A lynx analysis unit is delineated to represent a home range of a female lynx. Lynx analysis units are intended to approximate an area needed to support a female lynx year-round and should have sufficient primary vegetation in condition that is suitable for survival and reproduction (U.S. Department of Agriculture and U.S. Department of the Interior 2000, U.S. Department of Agriculture 2007d, Interagency Lynx Biology Team 2013). Lynx analysis units should be approximately 16,000 to 32,000 acres but may be larger in less continuous, fragmented habitat (U.S. Department of Agriculture and U.S. Department of the Interior 2000). At least 6,400 acres (10 miles^2) of primary habitat are necessary within each lynx analysis unit, which is the estimated amount of habitat needed to support a female lynx all year (Interagency Lynx Biology Team 2013). Existing ecological units, such as watersheds (6th hydrologic unit codes (HUCs)), are to be used as the basis for mapping lynx analysis units except for the following situations: (a) when HUCs with only small patches of habitat are beyond the daily movement distance of a lynx, the lynx analysis unit can be discarded (Interagency Lynx Biology Team 2013); or (b) HUCs with insufficient amounts of lynx primary habitat can be combined among neighboring lynx analysis units (U.S. Department of Agriculture and U.S. Department of the Interior 2000).

Lynx Analysis Units which had been previously delineated for the Nez Perce-Clearwater National Forests, in accordance with the guidance provided in the Lynx Conservation Assessment and Strategy (LCAS) and the Northern Rockies Lynx Management Direction in 2007, had not changed since they were first delineated. The area covered by the lynx analysis units on the Forest is the primary area used for analysis of effects on lynx. For analysis of cumulative effects under the Endangered Species Act, the area selected is large enough to include the effects of activities on adjoining non-federal lands but not so large to obscure effects on a biologically meaningful unit. Standard LAU S1 requires that changes in Lau boundaries 1) be based on site-specific habitat information and 2) are only incorporated after review but e Regional Office. Such review and approval of lynx analysis units should not result in re-initiation of consultation. Watersheds (HUCs) were the basis for delineating the lynx analysis units on the Nez Perce-Clearwater National Forests in 2014. The Forest mapped primary habitat (see below) and used the calculated area of primary habitat within each HUC to determine if it contained sufficient habitat to support a lynx. Where there were HUCs that did not contain sufficient habitat, adjacent HUCs were either combined in full or portions of those were appended to neighboring HUCs. When combining portions of neighboring HUCs, we attempted to consolidate habitat in a way that best represented a potential lynx home range. When drawing lynx analysis unit boundaries that did not follow HUC boundaries, we preferred to follow geographic features such as streams or ridges. In some areas, consolidated habitat was not bounded by a geographic feature to follow; and in these cases, we buffered the primary habitat by 200 meters and drew the lynx analysis unit boundary on or near to the buffer edge.

Mapping Potential Habitat

Potential Vegetation Type is a landscape scale classification that delineates expected vegetation type groups using ecosystem attributes such as land type, soils, topography, climate, and geographic location. Classifications of potential vegetation are often associated with well-documented stable vegetation communities or habitat types that occur in the absence of disturbance (Cooper et al. 1991). As a result, potential Vegetation Types were the basis for mapping lynx habitat because they represent the ecological potential for an area to support primary lynx habitat (subalpine fir, Engelmann spruce, and lodgepole pine).

Important advantages exist when using potential vegetation type groups rather than existing vegetation for lynx mapping. Existing vegetation better describes the variability in vegetation cover that exists because of disturbance and seral stage; however, potentially suitable lynx habitat would be underestimated if defined using existing vegetation because stands affected by stand-replacing wildfires and regeneration harvest, which produce stands in initiation structural stage, are reflected in existing vegetation. Forest managers need to consider that stands in early stand initiation stage and stands in stem exclusion stage are potential lynx habitat even if they cannot currently support lynx.

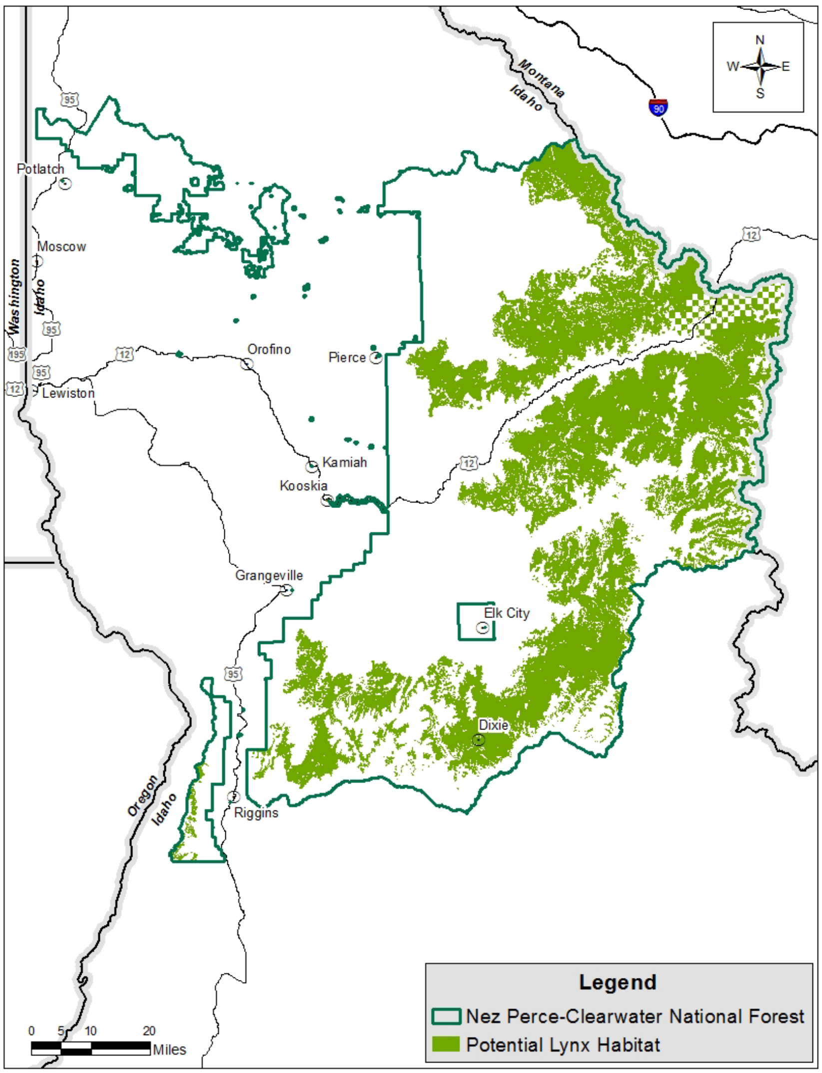


Figure 23. Potential Lynx Habitat within the Nez Perce-Clearwater National Forests

Three categories of habitat, “general,” “denning,” and “currently unsuitable” were mapped through this effort. General Habitat is a combination of primary and secondary habitat. Primary habitat represents forest types necessary to support lynx survival and reproduction (Ruediger et al. 2000b, Interagency Lynx Biology Team 2013). In northern and central Idaho this is subalpine fir, Engelmann spruce, and lodgepole pine potential vegetation types (Interagency Lynx Biology Team 2013). Secondary Habitat was considered where cedar-hemlock, grand fir, or Douglas-fir on moist sites at higher elevations in central

Idaho support snowshoe hares (Murray et al. 2002) is interspersed with primary habitat. Because lynx are not associated with these forest types (Interagency Lynx Biology Team 2013) but because they do support snowshoe hares, we only included secondary habitat within 200 meters of primary habitat.

To delineate denning habitat within our map of potential lynx habitat, we used maps of existing vegetation (VMap 2014) to select mature stands with high canopy closure. We selected stands with at least (≥) 40 percent canopy cover and used large trees as an indicator for mature forest by selecting for stands with trees with at least (≥) 15-inch diameter at breast height (DBH). In northern Idaho, 17 inches is the minimum DBH for old growth subalpine fir and 13 inches is the minimum DBH for old growth lodgepole pine (Green et al. 1992). We used the 15 inches criteria for denning because a stand dominated by trees of the age and size listed in Green et al. (1992) is generally good potential old growth and will likely have the characteristics of lynx denning habitat.

At the time of the habitat and lynx analysis unit re-mapping it was determined that, until such a time as the Forest Plan Revision was complete, the Forest would utilize the updated habitat model overlain with the previously mapped lynx analysis unit boundaries. As a result, several lynx analysis units currently have little to no habitat associated with them (table 47 and table 48).

As with all models, there is uncertainty in the lynx habitat mapping process used to estimate lynx habitat potential on the Nez Perce-Clearwater National Forests, particularly given the lack of empirical data for lynx habitat use patterns in this area, but also considering the limits of available data.

Based on the 2014 mapping effort, modeled lynx habitat occurs on an estimated 1,487,871 acres of Nez Perce-Clearwater lands, a reduction of 252,130 acres from previous habitat estimates (table 42 and table 43). The remainder of Nez Perce-Clearwater lands occur at low elevations lacking deep, fluffy snow or are inclusions that are not capable of producing boreal forest habitat, such as dry forest types and non-forested lands.

Table 42. Modeled Lynx habitat acres by forest prior to 2014

Forest	Acres
Clearwater (Occupied)	930,000
Nez Perce (Unoccupied)	810,000
TOTAL	1,740,000

Table 43. Modeled Lynx habitat acres by forest 2014 to 2019

Forest	Acres
Clearwater (Occupied)	743,275
Nez Perce (Unoccupied)	744,596
TOTAL	1,487,871

On the Nez Perce-Clearwater, vegetation dominance types which provide lynx/snowshoe hare habitat (subalpine fire/Engelmann spruce, lodgepole pine) are primarily distributed throughout the cool-moist and cold Broad Potential Vegetation Types (BPVTs). These two BPVTs comprise approximately 37.4 percent of the total planning area. Lodgepole pine is dominant in the Cold BPVT, less so in the Cool/Moist BPVT (table 44). Engelmann spruce and subalpine fir tree species may also be found in other forest dominance types because they are shade tolerant and commonly occur in mid- and understory tree canopy layers with western larch, lodgepole pine, and/or Douglas fir in the overstory. Lodgepole pine is a fire adapted species that can dominate after wildfire. It can also be a component in mixed conifer stands. However, forests dominated by subalpine fir and Engelmann spruce tend to support higher-severity fires due to the lower fire frequency, higher tree densities, multiple canopy layers, and greater litter depths and fuel loads typical in these stands. These stand-replacing fires make lynx habitat temporarily unsuitable. The multistory forest conditions that typically develop in subalpine fir and Engelmann spruce-dominated forests are also highly susceptible to damage from western spruce budworm. In contrast to stand-replacing wildfires, beetles may only kill some of the overstory trees, allowing the understory to respond.

Table 44. Current Forestwide dominance of lodgepole pine, Engelmann spruce, and subalpine fir (i.e., preferred lynx habitat) associated broad potential vegetation type groups within the Nez Perce-Clearwater National Forests.

Dominance Type	Cold (12.4% of Planning Area)	Cool Moist (25% of Planning Area)	TOTALS
Lodgepole pine	41%	15%	56%
Engelmann spruce	7%	22%	29%
Subalpine fir	39%	27%	66%

Data Source: R1 Hybrid 2015 Dataset

Dominance type and structural stage within the BPVTs can change over time due to factors such as fire, insects and disease, vegetation management, and forest succession (U.S. Department of Agriculture 2014a). For Forest Planning this has been termed the Natural Range of Variability (NRV). Modelling of forest succession and development to inform NRV spanned 1,000 years. Referencing this NRV for the Planning Area informs desired conditions, it is not intended to return precisely to conditions at a single point in time rather to understand the full range of conditions that were supported prior to substantial human influence. The NRV provides a frame of reference for ecological integrity and resilience. It reflects the conditions that have sustained the current complement of wildlife and plant species on the Forest and provides context for understanding the natural diversity of vegetation and the processes that sustain it. The modeling results estimating the NRV for lynx habitats suggests that spruce-fir stands currently dominate more than they did under natural fire regimes while lodgepole dominates less than it did in the past (table 45 and table 46).

Table 45. Dominance Type Natural Range of Variability and current conditions within the Cold Broad potential vegetation type within the Nez Perce-Clearwater National Forest

Dominance Type	Natural Range of Variability Range	Natural Range of Variability Average	Current
Subalpine fir/Engelmann spruce	4-9%	6%	45.8%
Lodgepole pine	30-37%	33%	41.2%

Table 46. Dominance Type Natural Range of Variability and current conditions within the Cool Moist Broad potential vegetation type within the Nez Perce-Clearwater National Forest

Dominance Type	Natural Range of Variability Range	Natural Range of Variability Average	Current
Subalpine fir/Engelmann spruce	39-63%	52%	49.2%
Lodgepole pine	24-34%	30%	14.6%

The total amount of lynx habitat relative to non-habitat remains relatively constant over time, but the various structural stages of lynx habitat change over time through processes of disturbance and natural succession. Generally, Forestwide conditions (stand age/tree size) are currently skewed more toward the mid-seral conditions. Historically, there were more young and late-seral forest stands.

The future pace of vegetation change across the landscape because of silvicultural treatments and natural disturbance is 150 years. The short-term (20 year) and long-term (50 year) timeframes provide timesteps to estimate the rate of change toward desired conditions in the 150-year scenario.

Table 47. Current Forestwide Cover Dominance Types and Associated Broad Cold Potential Vegetation Type Groups within the Nez Perce-Clearwater National Forests

Size Class in Diameter at Breast Height (DBH)	Habitat Indicator	Current Condition	Desired Range
Seral grass/shrub	Temporarily Unsuitable	27%	5-20%
0-4.9” DBH	Temporarily Unsuitable	6%	15-30%
5-9.9” DBH	Stand Initiation Hare Habitat	33%	5-25%
10-14.9” DBH	Suitable Habitat if not in Stem Exclusion Stage	26%	5-15%
15-19.9” DBH	Mature Forest	6%	25-50”
20” + DBH	Mature Forest	2%	0-5%

Table 48. Current Forestwide Cover Dominance Types and Associated Broad Cool Moist Potential Vegetation Type Groups within the Nez Perce-Clearwater National Forests

Size Class in Diameter at Breast Height (DBH)	Habitat Indicator	Current Condition	Desired Range
Seral grass/shrub	Temporarily Unsuitable	34%	5-25%
0-4.9” DBH	Temporarily Unsuitable	3%	15-30%
5-9.9” DBH	Stand Initiation Hare Habitat	15%	10-25%
10-14.9” DBH	Suitable Habitat if not in Stem Exclusion Stage	27%	10-25%
15-19.9” DBH	Mature Forest	13%	15-30%
20” + DBH	Mature Forest	8%	5-10%

Early Stand Initiation Habitat (i.e., Currently/Temporarily Unsuitable Habitat)

Early Stand-initiation habitat is that which has experienced recent disturbance such as stand-replacing fire, wind events, timber harvest, or other processes that removed or dramatically reduced live standing trees, temporarily reducing the suitability as foraging, denning, and even travel areas for resident lynx. As these areas begin to regenerate, low-level vegetation may provide habitat for snowshoe hares and other prey species in summer but would not provide winter snowshoe hare habitat until natural succession increases tree height and density to achieve adequate horizontal cover above average snow depth (Ulizio et al. 2007). Currently unsuitable habitat or temporarily unsuitable habitat will be used interchangeably for the purposes of analysis and description of habitat.

Historically, fire, insects, and disease have been the primary processes which result in reverting forest vegetation to an early stage of succession or creating openings within the forest canopy on the Nez Perce-Clearwater National Forests. This category is estimated based upon the effects of recent severe fire and timber harvest databases (MTBS and FACTS respectively) to indicate areas of potential habitat that have been recently altered.

The number of years after a stand replacing disturbance, and when a stand has the horizontal stand structure required to support snowshoe hare and lynx depends, greatly on the degree of disturbance, stand ecology, local climate, and topography. We estimated that this stage lasts approximately 20-25 years, post stand regenerating disturbance, based on forest vegetation simulation modelling. Thus, early stand initiation habitat can be considered "recruitment stands" for future lynx habitat.

Modeling suggests that the acreage of lynx habitat in a temporarily unsuitable condition across the Nez Perce-Clearwater fluctuated a great deal from decade to decade.

The distribution of early stand initiation habitat was most recently updated in 2019 after the Forests experienced substantial wildfire activity between 2015 and 2018. Habitat data was updated to re-evaluate the amount of temporarily unsuitable habitat across the Forest as a result of these disturbances (Lutes 2019). The total amount of potential habitat across the Forests did not change as a result of this mapping, only distribution of habitat which was considered currently unsuitable.

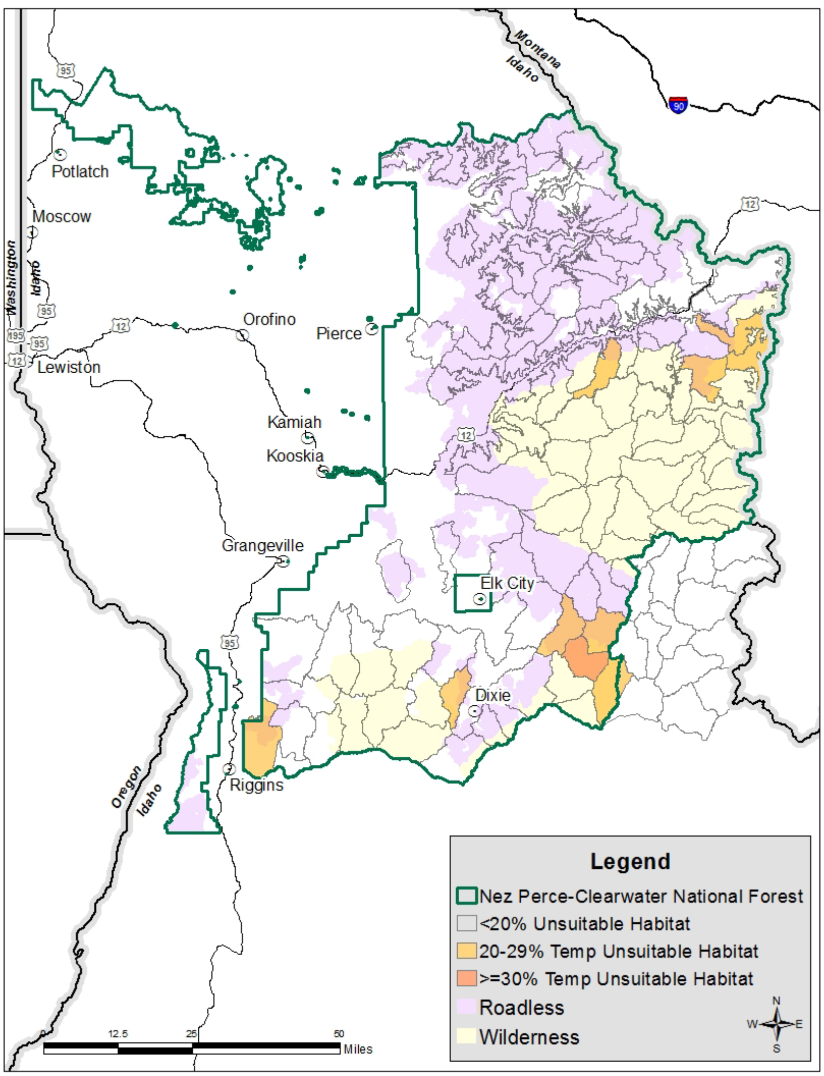


Figure 24 Temporarily unsuitable habitat by Lynx Analysis Unit and Management Area

The Northern Rockies Lynx Management Direction provides a Standard (VEG S1) which limits vegetation management projects which regenerate forests within lynx analysis units when 30 percent or more of the mapped potential lynx habitat within a lynx analysis unit is in this temporarily unsuitable condition (with certain exemptions for fuels treatments in wildland urban interface). As of 2019 the total amount of temporarily unsuitable habitat in stand initiation structural stage was about 105,969 acres, or about 7.1 percent of the total lynx habitat on the forest. Lynx habitat within one lynx analysis unit has over 30 percent currently unsuitable. This lynx analysis unit is within the unoccupied portion of the forest and completely within the Frank Church River of No Return Wilderness Area. Current acreages of unsuitable habitat within this lynx analysis unit is solely a result of wildfire activity. Another nine lynx analysis units are over 20 percent, of these, seven are either in wilderness or Idaho Roadless Areas and therefore currently unsuitable habitat is also a result of fire, not the result of timber management projects.

Table 49. Currently unsuitable habitat by Lynx Analysis Unit based on 2019 habitat update

Forest[1]	LAU	Total Lynx Habitat Acres	Percent Currently Unsuitable	Wilderness[2]	Roadless[3]	Acres to 30%
CLW	1	0	0%	None	None	N/A
CLW	2	0	0%	None	None	N/A
CLW	3	5	0%	None	None	N/A
CLW	4	11,953	0%	None	None	3,586
CLW	5	20,943	0%	None	None	N/A
CLW	6	24,495	0%	None	None	6,148
CLW	7	19,004	2%	None	None	5,701
CLW	8	2,713	0%	None	None	7,414
CLW	9	5	0%	None	None	N/A
CLW	10	0	0%	None	None	N/A
CLW	11	0	0%	None	None	N/A
CLW	12	1	0%	None	None	N/A
CLW	13	10,140	5%	None	None	2,325
CLW	14	11,541	0%	None	None	3,.462
CLW	15	14,845	0%	None	None	4,454
CLW	16	9,598	0%	None	None	2,879
CLW	17	12,771	4%	None	None	3,380
CLW	18	16,838	4%	None	None	3,573
CLW	19	6,320	0%	None	None	1,896
CLW	20	12,500	0%	None	None	3,750
CLW	21	6,369	0%	None	None	1,911
CLW	22	16,015	0%	None	None	4,805
CLW	23	18,423	3%	None	None	3,573
CLW	24	20,061	0%	None	None	6,018
CLW	25	15,278	7%	None	None	3,573
CLW	26	25,645	6%	None	None	6,241
CLW	27	20,975	10%	None	None	4,144
CLW	28	25,904	3%	None	None	3,573
CLW	29	19,244	12%	None	None	3,368
CLW	30	12,012	2%	None	None	3,573

Forest[1]	LAU	Total Lynx Habitat Acres	Percent Currently Unsuitable	Wilderness[2]	Roadless[3]	Acres to 30%
CLW	31	13,857	2%	None	None	3,573
CLW	32	11,314	0%	None	None	3,394
CLW	33	10,075	0%	None	None	3,.022
CLW	34	7,373	0%	None	None	2,212
CLW	35	14,076	14%	None	None	2,253
CLW	36	17,257	0%	None	None	5,177
CLW	37	13,418	1%	None	None	3,573
CLW	38	20,677	9%	None	None	4,324
CLW	39	3,793	15%	None	Completely - P, SAHTS	586
CLW	40	13,840	2%	None	None	3,573
CLW	41	16,794	1%	None	None	3,573
CLW	42	13,409	0%	None	None	4,023
CLW	43	19,015	1%	None	None	3,573
CLW	44	16,450	7%	None	None	3,838
CLW	45	16,823	25%	Mostly within the Selway-Bitterroot Wilderness	Partially - BCR	848
CLW	46	14,381	14%	None	None	2,311
CLW	47	11,555	6%	None	None	2,768
CLW	48	25,038	10%	None	None	5,068
CLW	49	19,264	13%	None	None	3,338
CLW	50	22,774	24%	Partially within the Selway-Bitterroot Wilderness	Partially - WLR, P	1,468
CLW	51	20,013	7%	None	None	4,598
CLW	52	17,599	23%	Partially within the Selway-Bitterroot Wilderness	Partially - BCR, WLR	1,194
CLW	53	16,401	21%	Completely within the Selway-Bitterroot Wilderness	None	1,518
CLW	54	19,003	18%	None	None	2,213
NEZ	2070502	4,419	24%	Completely within the Frank Church of No Return Wilderness	None	253
NEZ	2070601	20,384	29%	Partially within the Frank Church of No Return Wilderness	Partially - P	223
NEZ	2070602	14,386	32%	Completely within the Frank Church of No Return Wilderness	None	-245
NEZ	2070603	6,576	18%	None	None	810
NEZ	2070702	33,915	16%	None	None	4,677

Forest[1]	LAU	Total Lynx Habitat Acres	Percent Currently Unsuitable	Wilderness[2]	Roadless[3]	Acres to 30%
NEZ	2070703	8,931	9%	None	None	1,854
NEZ	2070705	10,350	5%	None	None	2,580
NEZ	2070706	3,994	2%	None	None	1,123
NEZ	2070804	7,193	10%	None	None	1,438
NEZ	2071001	15,921	7%	None	None	3,699
NEZ	2071002	11,369	29%	Partially within the Gospel Hump Wilderness	Partially - BCR	100
NEZ	2071003	10,142	4%	None	None	2,663
NEZ	2071004	5,270	12%	None	None	924
NEZ	2071101	6,520	2%	None	None	1,837
NEZ	2071102	14,601	4%	None	None	3,794
NEZ	2090204	5,626	22%	None	Partially - BCR	449
NEZ	2090401	16,038	3%	None	None	4,261
NEZ	2090402	10,889	2%	None	None	3,043
NEZ	2090502	19,954	2%	None	None	5,671
NEZ	3010501	18,653	10%	None	None	3,686
NEZ	3010503	6,872	1%	None	None	1,997
NEZ	3010602	10,589	15%	None	None	1,598
NEZ	3010603	11,016	4%	None	None	2,878
NEZ	3010604	16,348	7%	None	None	3,825
NEZ	3010701	9,268	0%	None	None	2,780
NEZ	3010702	8,730	1%	None	None	2,515
NEZ	3010703	7,465	2%	None	None	2,068
NEZ	3010704	7,585	1%	None	None	2,192
NEZ	3010705	8,164	0%	None	None	2,428
NEZ	3010706	11,870	6%	None	None	2,839
NEZ	3020101	11,208	5%	None	None	2,819
NEZ	3020102	12,857	17%	None	None	1,673
NEZ	3020103	13,216	7%	None	None	2,992
NEZ	3020104	18,482	5%	None	None	4,655
NEZ	3020105	13,582	14%	None	None	2,155
NEZ	3020106	14,656	9%	None	None	3,042
NEZ	3020107	24,523	18%	None	None	3,033
NEZ	3020109	29,853	6%	None	None	7,222
NEZ	3020110	11,273	5%	None	None	2,862
NEZ	3020202	15,685	3%	None	None	4,212
NEZ	3020203	15,684	8%	None	None	3,515
NEZ	3020204	12,287	7%	None	None	2,826
NEZ	3020301	23,241	23%	None	Mostly - BCR	1,551
NEZ	3020302	17,965	8%	None	None	3,965
NEZ	3020304	23,146	3%	None	None	6,289

Forest[1]	LAU	Total Lynx Habitat Acres	Percent Currently Unsuitable	Wilderness[2]	Roadless[3]	Acres to 30%
NEZ	3020305	28,445	2%	None	None	7,993
NEZ	3020402	31,411	1%	None	None	9,097
NEZ	3050102	21,003	11%	None	None	4,035
NEZ	3050302	11,883	1%	None	None	3,449
NEZ	3050401	15,612	10%	None	None	3,045
NEZ	3050601	20,732	0%	None	None	6,173
NEZ	3050602	18,334	1%	None	None	5,379

[1]CLW = Clearwater (occupied) portion of the Forest, NEZ = Nez Perce (unoccupied) portion of the Forest

[2]SBW = Selway-Bitterroot Wilderness, FRCNR = Frank Church River of No Return Wilderness, GH = Gospel Hump Wilderness,

[3]BCR = Roadless, Backcountry Recreation Theme, P = Roadless, Primitive Theme, WLR = Roadless, Wildlands Recreation, SAHTS = Special Area of Historic or Tribal Significance

Stand Initiation Structural Stage

The stand initiation phase occurs following major disturbances, such as stand-replacing fire; it typically begins once small trees and shrubs have regenerated but may only last another decade or two until the stand moves into stem exclusion condition, depending upon factors such as elevation and stem density. On the Nez Perce-Clearwater National Forests, it takes about 20-25 years after a stand regenerating disturbance to produce tree height and density selected by hares, and stands can persist as snowshoe hare habitat for up to 40 years or more after a disturbance.

The Northern Rockies Lynx Management Direction provides a Standard (VEG S5) which limits where precommercial thinning projects which reduce snowshoe hare habitat may occur (with certain exceptions and exemptions for fuels treatments in wildland urban interface). Stand-initiation stage snowshoe hare habitat can be detected with a reasonable level of accuracy from remotely sensed imagery. For the revised forest plan, stand initiation structural stage was modeled at the zero to five-inch size class as seedling and sapling with a canopy cover class of 40 to 100 percent and 20 or more years since the previous stand-replacing disturbance, such as high-severity fire or regeneration harvest.

Modeling results estimate that the amount of forest on the Nez Perce-Clearwater National Forest in early seral age classes has declined (U.S. Department of Agriculture 2014d). Early seral habitats and mature multi-story habitats are both known to support higher snowshoe hare numbers (Ruggiero et al. 1999, Berg et al. 2012). Early seral habitats such as early stand initiation structural stage (i.e., currently unsuitable habitat) primarily provide hare habitat in the summer. The amount of fire before fire suppression was previously much higher than today; however, we do not have fire severity data on fires prior to 1984 and thus do not know how much habitat was regenerated through stand replacing fires prior to that.

Table 50. Stand Initiation Structural Stage by Management Area

Management Area	Seedling/Sapling Class Acres	Proportion of Lynx Habitat
MA 1	8,099	1.3%
MA 2	11,773	1.9%
MA 3	8,138	3.3%
Totals	27,910	6.5%

Mature Multi-story Habitat

Multi-story hare habitat is defined by dense, multi-storied stands of mature, spruce-fir or lodgepole pine forest. Understories are typically characterized by dense stands of seedling-sapling subalpine fir. Such understories typically develop after some disturbance removes part of the overstory. Mature, multi-storied forest stand are also known to support higher snowshoe hare numbers. Multi-storied snowshoe hare habitat takes longer to develop through natural succession. Holbrook (2019) indicates that a landscape which provides 50-60 percent mature forest and 18-19 percent regenerating forest (i.e., stand initiation hare habitat) provides a high-quality mosaic of habitat for female lynx.

The Northern Rockies Lynx Management Direction provides a Standard (VEG S6) which applies to all vegetation management projects which reduce snowshoe hare habitat in multi-story mature or late successional forests with certain exceptions and exemptions for fuels treatments in wildland urban interface). Multistoried lynx habitat is provided by forests with a high proportion of trees in the diameter classes of 7 to 11 inches and 11 plus inches (Squires et al. 2010, Squires et al. 2017) and a dense understory providing snowshoe hare habitat. Based on this mature multi-storied hare habitat is fairly common, currently comprising around 30 percent of the potential lynx habitat area across the Nez Perce-Clearwater, but still below optimum thresholds identified in Holbrook (2019). However, the amount of horizontal cover (snowshoe hare habitat) within mature multi-story forests is difficult to model with any level of accuracy.

Lynx habitat model as "General" includes all potential habitat, other than currently unsuitable, from young to mature forest that have grown beyond the early stand initiation stage and have lost lower branches through a self-pruning process, and mature multi-stories forests which again provide ample horizontal cover.

Factors affecting Canada lynx in the Planning Area

Management Area Designation

The allocation of management areas can affect where vegetation management occurs. Approximately 39 percent of the Forestwide potential lynx habitat falls within designated wilderness areas, 43 percent within Roadless areas, and 18 percent on general forest managed for timber production and timber harvest (Figure 28, table 51).

Timber production is defined as 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 (36 CFR 219.9). Timber harvest means the removal of trees for wood fiber use and other multiple-use purposes.

Neither timber harvest nor timber production are allowed in designated wilderness or within areas designated as recommended wilderness (i.e., Primitive Roadless). As a result, approximately 50 percent of the lynx habitat on the Forest is subject to natural drivers of successions (fire, disease, windthrow, etc.) and protected from extensive human disturbance. Roadless Rule areas with a designation of anything other than Primitive are considered suitable for timber harvest for specific purposes but does not allow timber production. Idaho Roadless Rule areas also prevent the development of new roads, which makes much of the timber inaccessible or largely economically infeasible. This represents an additional 32 percent of the lynx habitat on the Forest (table 51).

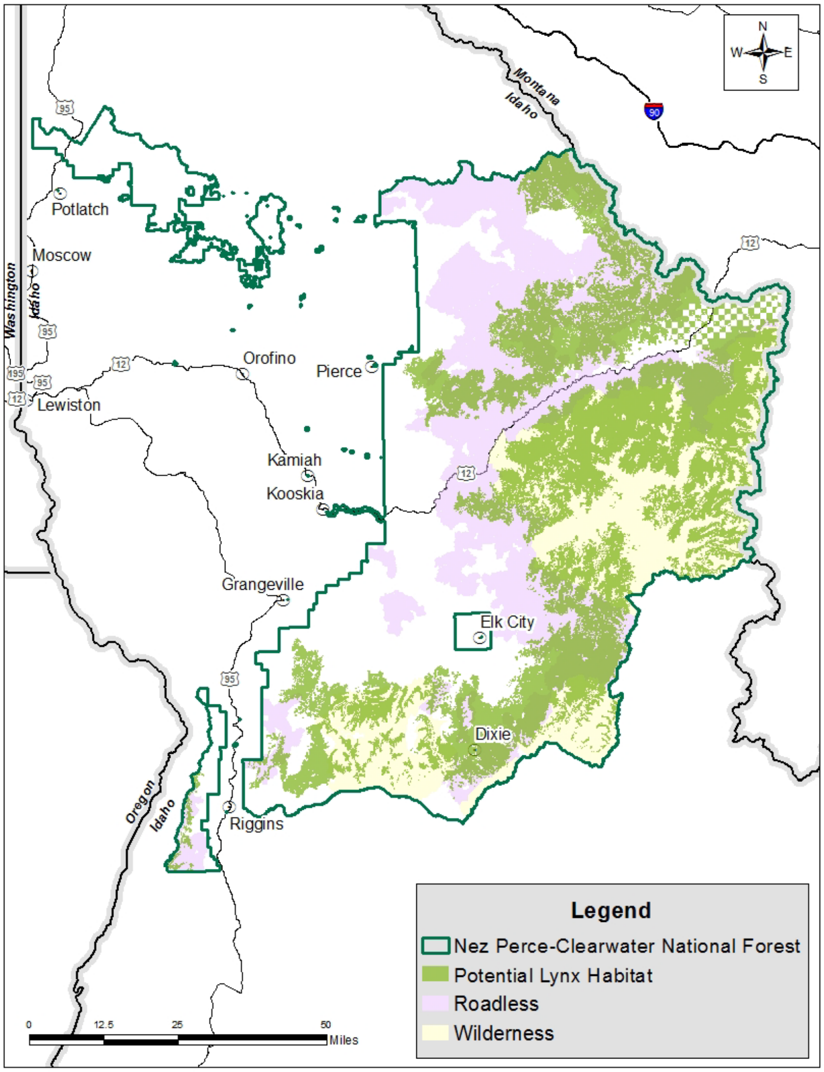


Figure 25. Current distribution of lynx habitat within management areas

The most permissive Idaho Roadless Area theme is Backcountry Restoration. Timber harvest can be conducted in the Backcountry Restoration theme, but it is only allowed in specific situations and for specific purposes as described below:

- To reduce hazardous fuels conditions outside a community protection zone defined as one-half mile from the boundary of an at-risk community or an area within one and a half miles of the boundary of an at-risk community where 1) sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community; 2) geographic feature that aids in creating an effective fire break, such as a road or a ridge top; or 3) Is in condition class 3 as defined by HFRA. if the project generally retains large trees as appropriate for the forest type and consistent with land management plan.
- To reduce hazardous fuel conditions outside a community protection zone where there is a significant risk that a wildland disturbance event could adversely affect an at-risk community or municipal water supply.
- In a portion of a backcountry/roadless area that has been substantially altered by construction of a forest road and timber cutting, prior to October 16, 2008.

- To improve threatened, endangered, proposed, or sensitive species habitat.
- To maintain or restore the characteristics of ecosystem composition, structure, or processes.
- To reduce the risk of uncharacteristic wildland fire effects to an at-risk community or municipal water supply.
- For personal or administrative use or where incidental to the implementation of an activity not prohibited.
- Where cutting, sale, or removal is incidental to the implementation of a management activity not otherwise prohibited by this subpart.

These actions must be approved by the Regional Forester and must:

- Maintain or improve one or more of the roadless characteristics.
- Maximize the retention of large trees as appropriate for the forest type to the extent these trees promote fire-resilient stands.
- Are consistent with land management plan components.

Wildland recreation is the most restrictive and timber harvest is allowed only as follows:

- Timber cutting, sale, or removal is prohibited except for personal or administrative use or where incidental to the implementation of an activity not prohibited.

The final environmental impact statement for the Idaho Roadless Rule projected that 0.01 percent of the lands managed under Idaho Roadless Rule would be affected by timber removal and/or road construction in the first 15 years. For the nearly 1,500,000 acres of roadless areas on the Nez Perce-Clearwater, this would total 1,500 acres over the 15-year period, or approximately 100 acres per year (U.S. Department of Agriculture 2008b). In the ten-year period from October 2008 to September 2018, approximately 1,800 acres have been affected through community protection zone fuels reduction, constructed fuel breaks during wildfires, and removal of post-fire roadside hazard trees. This estimate of 1,800 acres in the first 10 years is greater than the Idaho Roadless Rule projection. However, several extreme fire seasons have occurred during that time period and much of the tree removal has been tied to fire and post-fire hazard activities. If there is conflicting direction, the Idaho Roadless Rule will take precedent, as per the Idaho Roadless Rule (36 CFR 294.28(d)).

Table 51. Current acres and proportions of lynx habitat within in different management areas

Management Areas	Acres of Forestwide Lynx Habitat within Management Area	Percent of Forestwide Lynx Habitat
Forestwide Designated Wilderness	582,231	39%
Forestwide Primitive Roadless	157,046	11%
Forestwide Wildland Recreation Roadless	125,076	8%
Forestwide Special Area of Historic or Tribal Significance Roadless	21,254	1%
Forestwide Forest Plan Special Area Roadless	3,147	< 1%
Forestwide Backcountry Restoration Roadless	335,339	23%
Forestwide General Forest	263,778	18%
Forestwide Total	1,487,871	100%

Table 52. Current acres and proportions of lynx habitat within in the Clearwater National Forest

Management Areas	Acres of Forestwide Lynx Habitat within Management Area	Percent of Forestwide Lynx Habitat
Clearwater Designated Wilderness	196,813	27%
Clearwater Primitive Roadless	89,338	12%
Clearwater Wildland Recreation Roadless	121,286	16%
Clearwater Special Area of Historic or Tribal Significance Roadless	21,254	3%
Clearwater Forest Plan Special Area Roadless	2,347	<1%
Clearwater Backcountry Restoration Roadless	196,538	26%
Clearwater General Forest	115,699	16%
Clearwater Total Occupied Lynx Habitat	743,275	100%

Table 53. Current acres and proportions of lynx habitat within in the Nez Perce National Forest

Management Areas	Acres of Forestwide Lynx Habitat within Management Area	Percent of Forestwide Lynx Habitat
Nez Perce Designated Wilderness	385,418	52%
Nez Perce Primitive Roadless	67,708	9%
Nez Perce Wildland Recreation Roadless	3,790	<1%
Nez Perce Special Area of Historic or Tribal Significance Roadless	0	0%
Nez Perce Forest Plan Special Area Roadless	800	<1%
Nez Perce Backcountry Restoration Roadless	138,801	19%
Nez Perce General Forest	148,079	20%
Nez Perce Total Unoccupied Lynx Habitat	744,596	100%

Vegetation and Timber Management

Vegetation management activities, such as timber harvest, planting, and thinning, can affect lynx habitat conditions, such as forest composition, structure, dominance type, size class, and distribution. Specifically, timber management can affect the amount and distribution of dense horizontal cover providing snowshoe hare habitat, the amount and availability of large, downed wood providing denning habitat, and the development of multistory hare habitat used by lynx for winter foraging (Interagency Lynx Biology Team 2013).

The impacts of timber management on lynx habitat depends upon the type of treatments conducted, the time frames considered, and the forest type it is conducted in. For example, Holbrook et al. (2017) studied lynx use of timber management and found that lynx used timber treatments but took longer to achieve 50 percent use of regeneration and selection cuts between 34 to 40 years than thinning in about 20 years. Thus, full use of timber treatments by lynx can take as long as 40 years and varies by treatment type. Squires et al. (2010) recommended that management maintain habitat mosaics which should include abundant multistory, mature spruce-fir forests with high horizontal cover that are spatially well-distributed. Lynx may be reluctant to cross openings depending on the shape and size but could go around them. The results show that, where timber management happens, it can result in loss of habitat in the short-term (i.e., 20-40 years) depending on treatment.

Current Forest Plan direction under the Northern Rockies Lynx Management Direction governs many vegetation management activities forestwide. Standards and guidelines in the Northern Rockies Lynx Management Direction provide protection of, or reduce the impact to, lynx from these activities. Neither timber harvest nor timber production are allowed in designated wilderness or within areas designated as recommended wilderness (i.e., Primitive Roadless). As a result, approximately 50 percent of the lynx habitat on the Forest is subject to natural drivers of successions (fire, disease, windthrow, etc.) and protected from extensive human disturbance. Roadless Rule areas with a designation of anything other than Primitive are considered suitable for timber harvest for specific purposes but does not allow timber production. Timber management within lynx habitat on the Nez Perce-Clearwater National Forests has generally been avoided since the Canada lynx was listed. For example, since 2000, approximately 3,295 acres of lynx habitat (less than 1 percent) have been impacted by timber harvest.

Northern Rockies Lynx Management Direction Vegetation Standards

VEG S1

In summary, standard VEG S1 restricts vegetation management projects which regenerate lynx habitat in lynx analysis units where more than 30 percent of the lynx habitat is currently in early stand initiation structural stage that does not yet provide winter snowshoe hare habitat, with certain exceptions or exemptions allowed under the 2007 incidental take statement. On March 27, 2017, the Fish and Wildlife Service provided the Forest Service with an amended incidental take statement, which extended the time-frame of the 2007 biological opinion to 2022 (U.S. Department of the Interior 2017a). Limiting further regeneration harvest in lynx analysis units that do not meet all the VEG S1 exemption requirements until vegetation regrows into snowshoe hare habitat would help to support lynx by maintaining a mosaic of habitat, as called for under VEG O2, so that a lynx is more likely to be able to access sufficient prey resources within its home range. Table 49 provides a list of lynx analysis units and current levels of lynx habitat in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat.

VEG S2

In summary, standard VEG S2 does not allow timber management projects to regenerate more than 15 percent of lynx habitat on National Forest System lands within a lynx analysis unit in a 10-year period, with certain exceptions or exemptions allowed under the 2007 incidental take statement. By limiting the rate of regeneration harvest in each lynx analysis unit, this standard would help to maintain a mosaic of habitat over time, as called for under VEG O2, which would benefit lynx by providing distribution of prey resources across the landscape. Since 2000, 0.13 percent (1,966 acres) of all lynx habitat in the plan area has been treated by timber activities (FACTS database, accessed August 2019).

VEG S5

Standard VEG S5 limits precommercial thinning projects during the stand initiation structural stage until the stand no longer provides winter snowshoe hare habitat, with certain exceptions or exemptions allowed under the 2007 incidental take statement. The intent is to maintain the habitat conditions that are expected to produce high densities of snowshoe hares, which would contribute to sustaining the lynx population. There are six exceptions to the standard VEG S5 that could be used to meet other resource objectives.

The six exceptions to standard VEG S5 are as follows: (1) within 200 feet of administrative sites, dwellings, or outbuildings; (2) for research studies or genetic tree tests; (3) based on new, peer-reviewed information demonstrating that a project is not likely to affect lynx or would have short-term adverse effects but long-term beneficial effects; (4) for conifer removal or daylight thinning where aspen is in decline; (5) for daylight thinning of planted rust-resistant western white pine where 80 percent of the winter snowshoe hare habitat is retained; or (6) to restore whitebark pine. Exceptions 2 through 6 may only be utilized in lynx analysis units where standard VEG S1 is met. The overall effects of the VEG S5 exceptions on lynx across the Northern Rockies analysis area were expected to affect 64,320 acres, less than 0.5 percent, of snowshoe hare habitat (lynx foraging habitat) over a ten-year period. Few acres would be pre-commercially thinned at administrative sites and for research and genetic tests, and these would generally be benign with little or no adverse effect on lynx. Thinning to enhance whitebark pine and aspen would benefit other wildlife species and would occur on a limited number of acres of lynx habitat, resulting in a minor adverse effect on lynx. Daylight thinning would be allowed around individual western white pine in a manner that retains most winter snowshoe hare habitat. Daylight thinning may reduce lynx habitat effectiveness, but since this tree species has declined by 95 percent across its range, it was decided that a limited amount of thinning should be allowed to maintain western white pine on the landscape. The exceptions to VEG S5 were anticipated to result in the loss of lynx foraging habitat in some treated stands, which could have an adverse effect on lynx survival and reproduction by reducing prey resources.

Since 2007 the Forest has used approximately 22 acres of 1,930 acres of PCT exceptions for white pine (table 54). All of these treatments have occurred in lynx analysis unit 27 and represents approximately .1 percent of the lynx habitat within the lynx analysis unit.

Table 54. Pre-commercial thinning exception acres within lynx habitat (U.S. Department of Agriculture 2007d) (NRLMD Appendix K)

Habitat	Acres PCT for Research	Acres PCT for Genetic Testing	Acres PCT for Administrative	Acres PCT for White Pine	Acres PCT for White-bark Pine	Acres PCT for Aspen
Clearwater (Occupied)	0	0	0	1,930	0	0
Treated	0	0	0	22	0	0
Remaining	0	0	0	1,908	0	0
Nez Perce (Unoccupied)	0	0	120	0	0	0
Treated	0	0	0	0	0	0
Remaining	0	0	0	0	0	0

VEG S6

Standard VEG S6 limits vegetation management projects that would reduce winter snowshoe hare habitat in multistory forests, with certain exceptions or exemptions allowed under the 2007 incidental take statement[9]. Research in northwest Montana demonstrated that mature multistory forests provide important snowshoe hare habitat and are more important to lynx than younger stands during the critical winter period (Squires et al. 2010). Timber harvest would be allowed in areas that have the potential to improve winter snowshoe hare habitat but presently have poorly developed understories. Implementation of this standard is expected to benefit lynx by retaining and developing important winter habitat.

There are three exceptions to standard VEG S6: (1) to accommodate fuels reduction activities within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special-use permit improvements, including infrastructure within permitted ski area boundaries, to provide defensible space; (2) for research studies or genetic tree tests; and (3) for incidental removal during salvage harvest (e.g., removal due to location of skid trails). Exceptions 2 and 3 can only be used in lynx analysis units where standard VEG S1 is met. The exceptions to VEG S6 were anticipated to result in the loss of lynx foraging habitat in some treated multistory stands, which could have an adverse effect on lynx survival and reproduction by reducing prey resources. However, it was expected that an insignificant number of acres would be affected under the exceptions. To date none of the acres requested as exceptions to pre-commercial thinning within multistory forests (i.e., VEG S6) have been used.

Fire and Fuels Management

The greatest change agent in lynx habitat is stand replacing fire. These fires remove understory vegetation and tree canopy cover in the short-term but, depending on the moisture regime, large stand-replacing fires within lynx habitat may produce dense regenerating growth, providing high quality snowshoe hare foraging habitat after approximately 10 to 30 years. This vegetative condition provides high quality snowshoe hare habitat, but mature forests are also very important as winter foraging habitat. Typically, large stand replacing fires burn every 40 to 200 years across all stand types, with smaller, lower intensity fires occurring in the intervals between stand-replacing fires (U.S. Department of Agriculture 2007e).

Fire management includes wildfire, prescribed fire, and mechanical treatment of fuels. It is generally acknowledged that in the Northern Rocky Mountains fire suppression has altered historic vegetative patterns. This effect has been most pronounced within vegetation communities that have fire regimes that are of low intensity or of mixed severity. Many of these are drier community types and are not considered lynx habitat. Fire regimes in the spruce-fir habitats (lynx habitat) are characterized by many frequent small fires and periodic large stand replacing fires. Within fires, burn severity can vary because of temperature, humidity, time of day or night, and wind, leaving the habitat within a burned landscape variable. These habitats appear to have been little or less affected by fire suppression because the fire regimes within this type tend to be stand replacing events occurring at low frequencies (i.e., every 100 years or more) (Agee 2000).

The Nez Perce-Clearwater experienced several large stand-replacing wildfires in recent years. As a result, in the next 15 to 25 years, a substantial portion of burned forest is expected to develop sufficient height and density to provide dense horizontal cover of branches at the snow surface to provide snowshoe hare habitat. The table below uses Burned Area Reflectance Classification (BARC) data to evaluate how fires have burned in lynx habitat on the Nez Perce-Clearwater National Forest. BARC data uses a satellite-derived data layer of post-fire vegetation condition. The BARC has four classes: high, moderate, low, and

[9] Vegetative fuels treatments (including pre-commercial thinning, commercial thinning, regeneration harvest, intermediate harvest, prescribed fire, etc.) intended to protect communities at risk within the wildland urban interface which are exempted from NRMLD VEG Standards may occur on no more than 6 percent cumulatively on each national forest (see Fire and Fuels Management below).

unburned. Burn severity data is only recorded on fires larger than 1000 acres and has only been available since about 2000. Not all burned acres should be considered unsuitable for lynx, only those that burned at high burn severity. Fires have been by far the largest agent of disturbance in lynx habitat in the plan area, followed by insects and disease. An estimated 29 and 26 percent of lynx habitat in the cold and cool-moist potential vegetation type groups burned at high severity within these burn perimeters (table 55).

Table 55. Sum of feature acres forestwide burn severity across the Forest (occupied and unoccupied portions)

Broad Potential Vegetation Type	Cold	Cool Moist	Warm Dry	Warm Moist	Total Acres by Severity Class
High Severity	52,632 (29%)	65,778 (26%)	32,795 (10%)	18.246 (10%)	169,631 (18%)
Moderate Severity	48,997 (27%)	67,474 (27%)	62,487 (19%)	40,772 (22%)	219,730 (23%)
Low Severity	39,720 (22%)	59,265 (23%)	130,827 (41%)	72,718 (39%)	302,530 (32%)
Unburned to Low Severity	40,337 (22%)	60,151 (24%)	97,128 (30%)	53,149 (29%)	250,765 (27%)
Grand Total	181,686	252,669	323,237	184,885	942,566

Data Source: BARC data within fire perimeters since burn severity was recorded in BARC

Large wildfires in lynx habitat are also believed to be strongly associated with changing climate factors. Westerling et al. (2006) compiled information on large wildfires in the western United States from 1970 to 2004 and found that large wildfire activity increased suddenly and markedly in the mid-1980s with a higher frequency of large wildfires, longer durations, and longer seasons. The greatest increases occurred in mesic, mid-and high-elevation forest types in the northern Rocky Mountains. Fire exclusion (suppression) has had little impact on the natural fire regimes of these higher-elevation forest types in this area; instead, climate appears to be the primary driver of forest wildfire risk (Westerling et al. 2006).

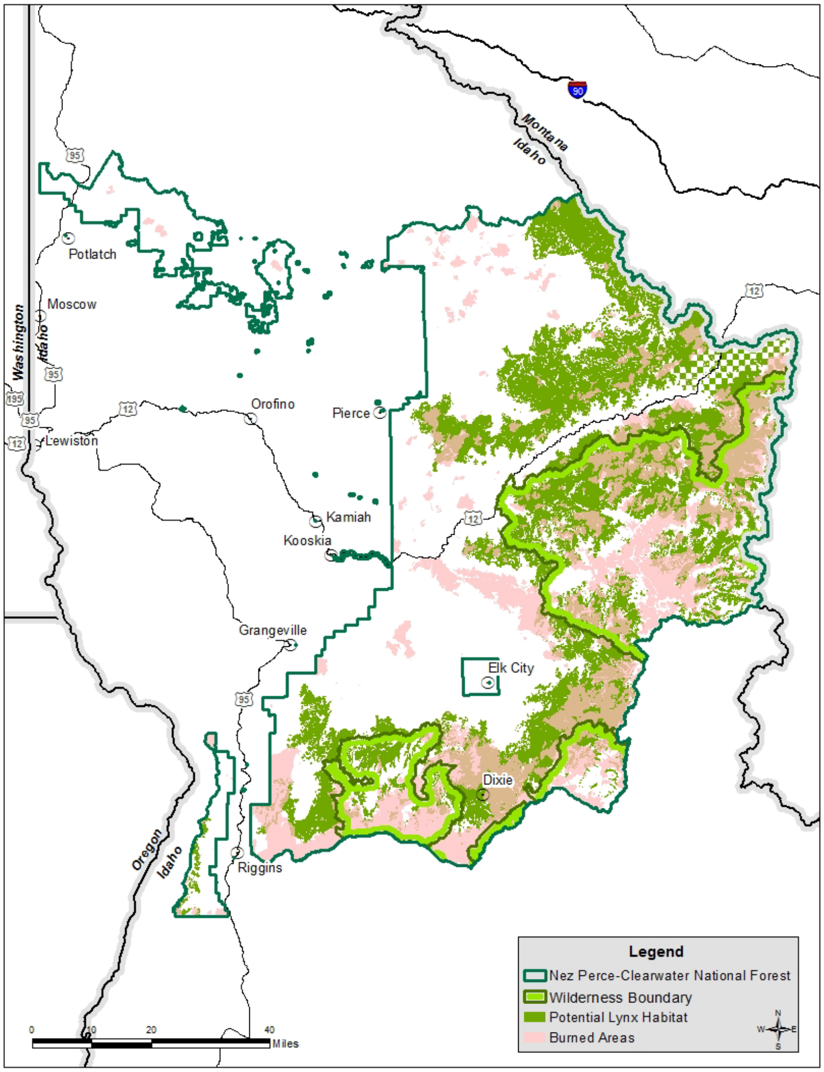


Figure 26. Wildfire activity across the forest in the last 20 years

Wildland fire, including management ignited prescribed burning and wildfires managed for resource objectives, have accounted for most fuels treatments over the last ten years; an annual average of 4,346 prescribed fire acres and 35,700 managed wildfire acres respectively.

Fire suppression over long periods of time can affect forest composition, dominance types, size class distribution, forest density, forest structure in single multi-story versus single story, habitat heterogeneity in distribution and size of habitat patches, and change in fire return intervals. Over shorter timeframes, fire suppression increases the amount of older age classes, decreases younger age classes, favors shade tolerant tree species over shade intolerant species, increases patch size resulting in less heterogeneity, increases forest density, and increases woody debris. As a result, fire suppression probably enhanced lynx habitat over the intermediate term because Engelmann spruce and subalpine fir dominance types are estimated to have increased (U.S. Department of Agriculture 2014c). Similarly, fire suppression has probably increased the amount of multi-storied mature forests, which are known to be selected by lynx. Long- term, fire suppression leaves many multi-storied stands susceptible to uncharacteristic wildfire. Over longer time frames, fuel conditions build up and increase the chance of stand replacing wildfires and cause wildfire to burn with uncharacteristic effects. They are also more susceptible to insect outbreaks.

Recently fires have increasingly burned larger, longer, and hotter than they have both historically and prehistorically across the western United States (Dennison et al. 2014). Large wildfires burning uncharacteristically have the potential long-term to reduce much of the multi-storied forest stands to a stage that is unsuitable for lynx use and recovery from uncharacteristic fires take longer and may not provide lynx habitat because of their size.

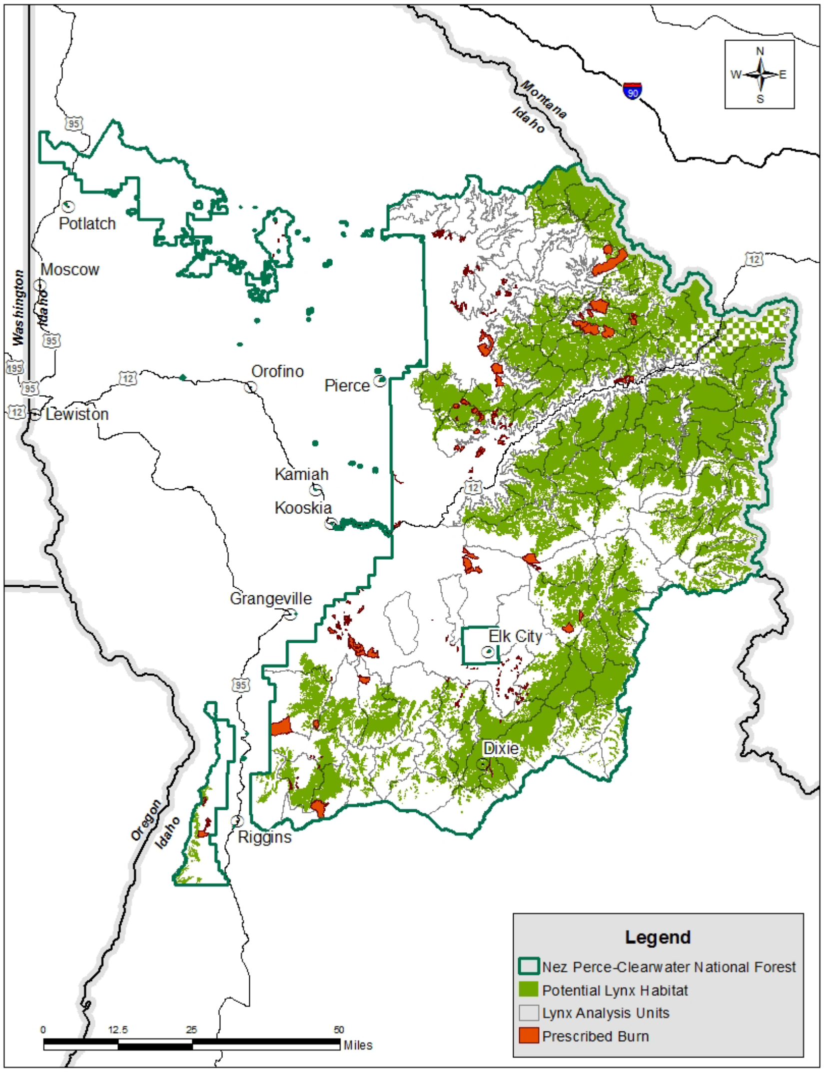


Figure 27. Prescribed fire activity across the forest in the last 20 years

As stated in the Northern Rockies Lynx Management Direction, VEG O3 encourages fire use activities that restore ecological processes and maintain or improve lynx habitat. Under guideline VEG G4, prescribed fire activities should not create permanent travel routes that facilitate snow compaction (which may facilitate access by other competing predators), and permanent firebreaks should not be constructed on ridges or saddles where they could interfere with lynx travel corridors. These various forms of snow compaction and structure within the snowpack could give a competitive advantage to other terrestrial predators/competitors with higher foot-loading that would normally have difficulty traveling and hunting efficiently in deep, unconsolidated snow (U.S. Department of the Interior 2017e).

Fuels Treatment Exemptions to Northern Rockies Lynx Management Direction VEG Standards

The wildland urban interface is defined by the Healthy Forests Restoration Act (HFRA) as an area within or adjacent to an at-risk community that is identified in a community wildfire protection plan or that is a certain distance around the community if a community protection plan is not available. The HFRA defines a community at risk as 1) an interface community as defined in the Federal Register notice of January 4, 2001 (66 FR 753), or a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) in or adjacent to Federal land, 2) has conditions conducive to a large-scale wildland fire, and 3) faces a significant threat to human life or property as a result of a wildland fire. For at-risk communities that have not yet designated their wildland urban interfaces as part of a Community Wildfire Protection Plan (CWPP), the HFRA has a default definition of wildland urban interface as an area extending 1/2 mile from the boundary of an at-risk community or extending 1 1/2 miles from the boundary when other criteria are met—for example, a sustained steep slope, a geographic feature that could help when creating an effective firebreak, or Condition Class 3 land or adjacent to an evacuation route. There is no distance limitation for evacuation routes.

The Biological Opinion for the Northern Rockies Lynx Management Direction (U.S. Department of the Interior 2017e) stated that fuels treatment projects in the wildland urban interface (WUI) could be exempted from compliance with VEG S1, VEG S2, VEG S5, and VEG S6 under certain conditions designed to protect communities at risk in recognition of the escalating monetary and societal costs associated with fires in the wildland urban interface. The Northern Rockies Lynx Management Direction evaluated the wildland urban interface based on a mile of where people live based upon 1) the federal register lists of at-risk communities published in January 2001 and August 2001, 2) the year 2000 population census data to indicate where interface (population density of 250 or more per square mile) and intermix communities (population density of 28-250 people per square mile) are as described in the January 2001 Federal Register Notice. The Notice says the federal agencies will focus on communities in the interface or intermix category. Based on these criteria, the Forest Service found that about 6 percent (729,000 acres) of lynx habitat within the area covered by the Northern Rockies Lynx Management Direction is within 1 mile of communities; therefore, Northern Rockies Lynx Management Direction limited the amount of acres that can exceed the standards to 6 percent of each occupied National Forest and added the U.S. Fish and Wildlife Service term and condition that fuel treatment projects can cause no more than 3 adjacent lynx analysis units to not meet standard VEG S1 (i.e., exceed 30 percent currently unsuitable habitat).

The Northern Rockies Lynx Management Direction also added Guideline VEG G10 which says fuel treatment projects within the wildland urban interface should be designed considering Standards VEG S1, S2, S5, and S6. The intent in adding this guideline is that although these vegetation standards do not apply to fuel treatment projects within the wildland urban interface as defined by HFRA, these projects should still consider the standards in the development of the proposal. In many cases projects can be designed to reduce hazardous fuels while providing for lynx needs. This guideline ensures lynx are considered in the project design – but allows for the flexibility of not meeting the standards in situations where meeting the standards would prevent the project from reducing the hazardous fuels in the wildland urban interface (U.S. Department of Agriculture 2007c). Additionally, a sound rationale for the need and efficacy of fuels treatments is needed when claiming the exemptions to the Vegetation Standards for fuels reduction projects implemented within wildland urban interface.

Exemptions from VEG S1 for fuel management would affect the forest mosaic by allowing more than 30 percent of lynx habitat within a lynx analysis unit to be in a stand initiation structural phase. Further, the exemption for fuel management in VEG S2 would allow more than 15 percent of a lynx analysis unit to be converted from suitable to stand initiation structural stage within a decade. The exemption from VEG S5 for fuel management would reduce natural levels of horizontal structure in early successional phases by allowing precommercial thinning during the stand initiation structural stage, prior to when the stand no longer provides winter snowshoe hare habitat. It is well documented that such thinning in hare habitat results in a corresponding decrease in the abundance of snowshoe hares (McDaniel et al. 2000); see also Biological Assessment Appendix J. Objectives, Standards, Guidelines, and Definitions found in the NRLMD Record of Decision. Thinning dense stands of young trees would adversely affect lynx by reducing the capacity of these stands to produce snowshoe hares.

Similarly, the exemption for fuel management from VEG S6 would likewise allow management actions that would reduce the horizontal cover and thus, quality of snowshoe hare habitat in older, multi-layered stands. Where exemptions from VEG S1 or S2 are used within the wildland urban interface, there would likely be adverse effects to lynx by reducing the quality and productivity of snowshoe hare habitat for at least 10 to 15 years, depending upon location, until treated stands regenerate to provide winter snowshoe hare habitat. Depending upon the fuel loading, location and funding, these stands may be treated again to retain them as fuel breaks and not allowed to regenerate, extending the length of time they remain in early seral conditions. Fuel breaks are not designed to stop fire spread rather; fuel breaks lower fuel loadings which also lower fire line intensity, improve effectiveness of aerial firefighting resources, increase firefighter access. The widths of fuel breaks are determined by terrain, fuels, potential fire behavior, expected/historical weather conditions, and economics. This is most likely in those areas closest to communities or structures (generally less than .25 miles); in most other cases, the Forest Service would consider moving the openings around to reduce fire size and intensity (Joan Dickerson, U.S. Forest Service, pers. comm. 2007). These openings would be allowed to regenerate (U.S. Department of Agriculture 2007c). As a result, the effects of treatments are temporary and no permanent loss of the inherent capacity of treated stands to provide lynx habitat is expected (U.S. Department of the Interior 2017f).

Exemptions in either VEG S5 or S6 may reduce the capacity of a lynx analysis unit to support lynx reproduction and/or occupancy. The impact would depend upon the size of the treated area as well as the inherent capacity of the site to produce snowshoe hares. Overall, the amendment limits the exemptions from VEG S5 and S6 to areas within the wildland urban interface, and so the anticipated adverse effects would occur in no more than six percent of lynx habitat (U.S. Department of the Interior 2007b). The effects of the exemptions are expected to be temporary with no loss in the potential of a site to provide lynx habitat (U.S. Department of the Interior 2017f).

These exempted fuels treatments were limited to 6 percent of mapped potential habitat on the Nez Perce-Clearwater National Forest. At the time of the 2007 ITS (carried into the amended ITS), this equaled habitat about 55,800 acres on the Clearwater National Forest (U.S. Department of Agriculture 2007a, U.S. Department of the Interior 2017f). Because of its unoccupied status the Nez Perce portion of the Forest was not allocated exemption acres through the ITS. However, should the Forest become occupied at some point in the future, approximately 48,600 acres of exemptions of Fuels treatments in wildland urban interface could be applied. Revised habitat mapping conducted in 2014 (and updated in 2019) substantially reduced the acres of modeled lynx habitat across the Nez Perce-Clearwater Forests. As a result, using 6 percent of the remapped habitat acres would reduce the allowable exemption acres on the Clearwater National Forest to 44,596. Approximately 44,676 acres on the Nez Perce could be considered for exemptions if this portion of the Forest becomes occupied at some point in time. The Northern Rockies Lynx Management Direction states that projects within unoccupied areas should consider, but do not need to apply, applicable standards and guidelines. In line with regional Forester direction the Forest has developed projects and analyzed the effects of individual projects on the unoccupied portion of the Forest as if it were occupied.

Since 2007, the Nez Perce-Clearwater has used none of the exempted acres allowed under the Northern Rockies Lynx Management Direction Incidental Take Statement or amended ITS. Instead, all fire and fuels projects, including prescribed fire, have abided the Northern Rockies Lynx Management Direction standards and guidelines, and consulted on individual projects (table 56 and table 57). For example, areas of mature-multistory and units proposed for pre-commercial thinning were evaluated, and where they overlapped with proposed fuels treatments, were dropped or boundaries were modified so as to not affect snowshoe hare habitat or exceed Northern Rockies Lynx Management Direction Standards, so exemption acres were not used.

Table 56. Hazardous fuels six percent exemption acres based on pre-2014 mapping[1]

Forest (Habitat)	Allocation (acres)	Acres Lynx Habitat Treated Within WUI	Acres Treated Using Exemptions	Current Balance (acres)
Clearwater (Occupied)	55,800	122	0	55,800
Nez Perce (Unoccupied)	48,600	0	0	48,600
Total	104,400	122	0	104,400

[1]6 percent of lynx habitat acres identified in the Appendix J of the NRLMD (U.S. Department of Agriculture 2007c)

Table 57. Hazardous fuels six percent exemption acres based on 2014/2019 mapping

Forest (Habitat)	Allocation (acres)	Acres Lynx Habitat Treated Within WUI	Acres Treated Using Exemptions	Current Balance (acres)
Clearwater (Occupied)	44,596	122	0	44,596
Nez Perce (Unoccupied)	44,676	0	0	44,676
Total	89,272	122	0	89,272

Habitat Fragmentation/Linkage Areas

Overall, most lynx habitats in the distinct population segments (DPS) range are naturally fragmented, which limits the abundance and density of both hares and lynx. The largest source of anthropogenic fragmentation throughout the DPS range is vegetation management (timber harvest and related silvicultural treatments). Human-caused fragmentation of the already naturally patchy lynx habitat can affect lynx by reducing their prey base and increasing the energetic costs of using habitat within their home ranges. In Montana, lynx selected habitat patches that supported snowshoe hares and in winter avoided recent clear-cuts or other open patches (Squires et al. 2010, Interagency Lynx Biology Team 2013). Several other studies have documented lynx avoidance of large openings, especially during winter, probably because such habitats are rarely used by hares and would not, therefore, attract foraging lynx. However, in some areas, vegetation management may benefit lynx by creating optimal hare (and thus lynx foraging) habitat. In other areas, there may be localized adverse (and potentially some beneficial) impacts of vegetation management to lynx habitats and perhaps individual lynx. However, there is no evidence that habitat loss and fragmentation from forest management or other anthropogenic activities have had population-level negative consequences for resident lynx in the DPS range or resulted in extirpation of lynx from areas that previously supported persistent resident populations (U.S. Department of the Interior 2017a). That said, many parts of the DPS range seem naturally only marginally capable of supporting resident lynx populations, and it is possible that relatively low levels of anthropogenic habitat loss and fragmentation, in addition to natural fragmentation, could diminish landscape-level hare densities to the point that resident lynx populations may be unable to persist (U.S. Department of the Interior 2017a).

Habitat fragmentation may be permanent, such as when converting forest habitat for residential developments or agricultural use, or temporary, such as when creating a forest opening through timber harvest until trees and shrubs regrow. Temporary fragmentation occurs because of departure of historic patterns of vegetation pattern. The amount of departure at a landscape scale is large, but the effect of this departure on fragmentation is probably slight. This could change if fires continue to burn hotter and larger than they did historically. Natural and human-caused alterations of landscape patterns can reduce the total area of habitat, increase the isolation of habitat patches, and affect movement between those patches of habitat (Interagency Lynx Biology Team 2013).

Land ownership within the Nez Perce-Clearwater Is predominantly USFS however there are areas of mixed ownership which may result in habitat fragmentation where private lands overlap with lynx habitat. The most substantial intermix of USFS and private lands which overlap with lynx habitat is within the "checkerboard" area Lolo Pass figure 28. The "checkerboard" area is identified as a potential linkage area and does support snowshoe hare habitat. Forestwide habitat is further fragmented as a result deeply incised river breaklands formed by the Lochsa, Selway, Clearwater, and Salmon Rivers (figure 28) which separate large, relatively contiguous blocks, of potential habitat. Despite this, approximately 82 percent of the lynx habitat on the Forest overlaps with wilderness and Idaho Roadless. As such, fragmentation of lynx habitat in the plan area due to anthropogenic developments is very low. Across the Forest the primary driver of habitat fragmentation, at least temporarily, remains fire.

The Northern Rockies Lynx Management Direction identified lynx linkage areas, which are intended to maintain connectivity and allow for the movement of lynx between blocks of habitat that are otherwise separated by intervening non-habitat areas, such as basins, valleys, and agricultural lands or places where habitat naturally narrows due to topographic features. The Northern Rockies Lynx Management Direction contains plan components requiring conservation measures in lynx linkage areas, including objectives, standards, and guidelines. These linkage areas were initially identified on the basis of expert opinion and were coarsely mapped at a broad scale. Linkage areas on the Nez Perce-Clearwater are shown in figure 28.

Squires (Squires et al. 2013) used telemetry data from 1998 to 2007 to create a broad-scale resource selection model that predicted "putative movement corridors" across the species' distribution in the northern Rocky Mountains (Squires et al. 2013). This analysis included quantification of the relative likelihood of lynx crossing major highways – one of the major hypothesized anthropogenic threats to lynx connectivity. Of 44 radio-collared lynx with home ranges near 2-lane highways; only 12 crossed the highway.

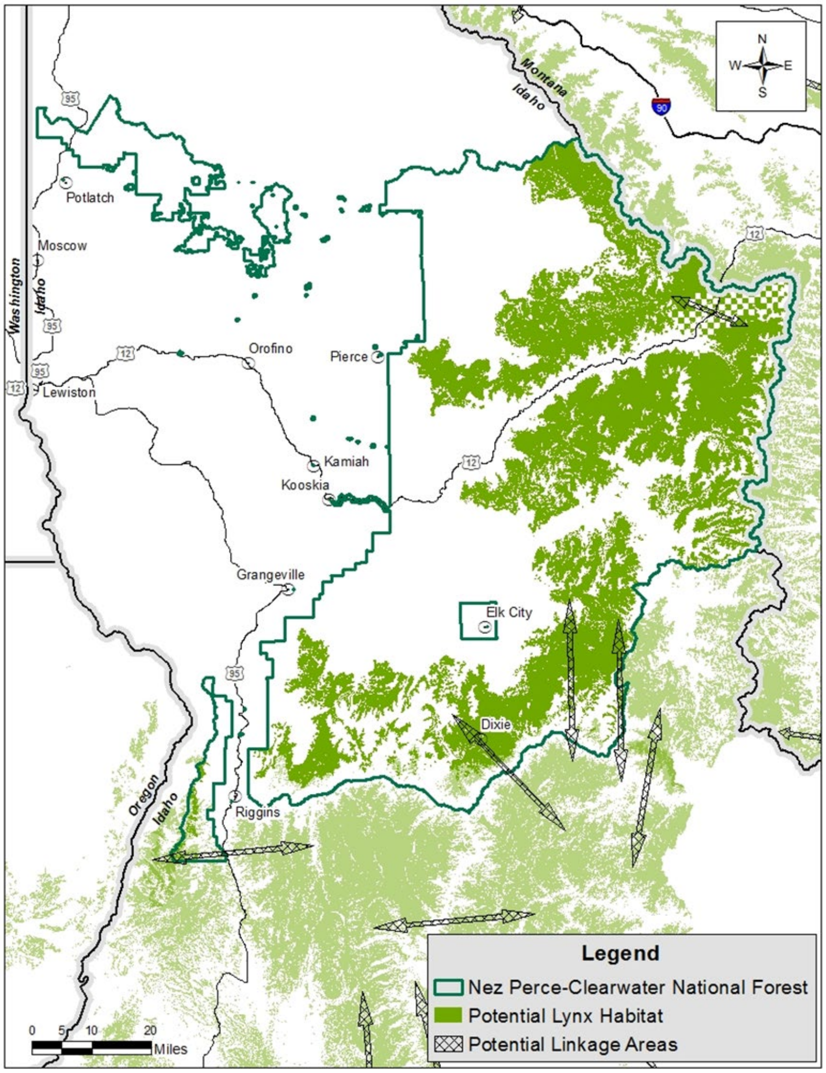


Figure 28. Linkage areas identified in the Northern Rockies Lynx Amendment

Squires et al. (2013) stated, "given that increased traffic and urbanization are projected for the northern Rockies, mitigation such as land purchases and conservation easements may be necessary to preserve connectivity among lynx populations." Private land development, especially along highway corridors in mountain valleys, may also fragment habitat and impede the movement of lynx. The Nez Perce-Clearwater does not have jurisdiction over state or federal highways or lands under other ownerships, such as private, state, and tribal. The Forest Service can support habitat connectivity through its management of National Forest System lands by encouraging or acquiring conservation easements along highways or cooperating in identifying appropriate locations for installation of highway crossing structures. Objective LINK O1 within Northern Rockies Lynx Management Direction promotes habitat connectivity by working with adjacent landowners to pursue conservation easements, land exchanges or other actions which would also seek to acquire parcels that could aid in connectivity for wildlife while Guideline LINK G1 supports retaining Forest Service lands in public ownership.

Developed and Dispersed Recreation

The Forest Service often categorizes recreational activities into two descriptions – developed recreation and dispersed recreation. Both types of recreation are categorized further by the recreation opportunity spectrum. The recreation opportunity spectrum includes a non-motorized and motorized access opportunities discussion, in addition to developed and dispersed opportunities. In some cases, these recreation opportunities are enhanced through the services offered by those in possession of a recreation special use permit for outfitting and guiding services or a recreation event.

Developed recreation occurs in settings that have been created or constructed for specific recreational purposes on the national forest, such as overnight campgrounds, picnic sites, downhill ski areas, rental cabins, boat docks, visitor centers, interpretive trails with display panels, organizational camps, and special use permitted recreation residence tracts. Fees may or may not be charged. These locations are usually given site names, inventoried, and categorized in Nez Perce-Clearwater databases with basic capacity information and design features.

Dispersed recreation typically happens across the entire forest without infrastructure beyond trails. Activities include hiking, bird watching, driving for pleasure, rock and ice climbing, boating, hunting, fishing, horseback riding, berry picking, backcountry skiing, snowmobiling, camping, and motorized and mechanized trail use. Dispersed camping occurs in the general forest area that has little or no Forest Service facilities provided, often where there is repeated dispersed use. Recreation special use permits are issued to private businesses, individuals, institutions, other government entities, and nonprofit groups to provide for occupancy and use of the national forests beyond what is normally available to the public.

Recreation Opportunity Spectrum

The recreation opportunity spectrum has six distinct classes in a continuum that describe settings ranging from highly modified and developed to primitive and undeveloped (Clark and Stankey 1979, U.S. Department of Agriculture 1982a). Five of the recreation opportunity spectrum classes apply to the Nez Perce-Clearwater: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, and rural. There are no urban recreation opportunity spectrum classes on the Nez Perce-Clearwater.

Table 58. Recreation opportunity spectrum classes and definitions

Recreation Opportunity Spectrum	Definition
Primitive (P)	This setting supports large, remote, wild, and predominantly unmodified landscapes. There is no motorized activity and little probability of seeing other people. Primitive settings are managed for quiet solitude away from roads, people, and development. There are few, if any, facilities, or developments. Most of the primitive settings coincide with designated wilderness boundaries and recommended wilderness areas.
Semi-Primitive Non-motorized (SPNM)	The semi-primitive non-motorized settings include areas of the Nez Perce-Clearwater managed for non-motorized use. Mechanized transport such as mountain bikes are often present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area. These settings are not as vast or remote as the primitive settings, but they also offer opportunities for exploration, challenge, and self-reliance.
Semi-Primitive Motorized (SPM)	This setting is managed for backcountry motorized use on designated routes. Routes are designed for off-highway vehicles and other high-clearance vehicles. This setting offers visitors motorized opportunities for exploration, challenge, and self-reliance. Mountain bikes and other mechanized transport are also sometimes present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area or providing portals to adjacent primitive or semi-primitive non-motorized areas.
Roaded Natural (RN)	This setting is managed as natural appearing with nodes and corridors of development that support higher concentrations of use, user comfort, and social interaction. The road system is generally well defined in this setting and can typically accommodate passenger car travel. System roads also provide access to other

Recreation Opportunity Spectrum	Definition
	recreation opportunity spectrum settings of semi-primitive motorized, semi-primitive non-motorized, and primitive areas.
Rural (R)	This setting represents the most developed recreation sites and modified natural settings on the Nez Perce-Clearwater. Facilities are designed primarily for user comfort and convenience.

The existing recreation opportunity spectrum is based on modeling of travel routes and terrain, as well as the 1987 forest plan direction. Recreation opportunity spectrum classes on the Nez Perce-Clearwater were mapped for summer and winter seasons to address the changes in motorized and non-motorized opportunities during these seasons. The following table displays the distribution of recreation opportunity spectrum classes across lynx habitat for both summer and winter. This existing condition distribution of classes is not the same as the desired recreation opportunity spectrum distribution from the 1987 forest plans. The existing condition classifications were based on the 1987 forest plans, as well as closure orders, the Clearwater Travel Plan, and other management decisions made since 1987 that have impacted the recreation opportunities across the Nez Perce-Clearwater.

Table 59. Current Acres of lynx habitat and percent of total lynx habit by recreation opportunity spectrum setting

Recreation Opportunity Spectrum Class	Summer Acres	Summer Percent	Winter Acres	Winter Percent
Primitive	502,900	34	530,909	36
Semi-primitive non-motorized	566,206	38	564,171	38
Semi-primitive motorized	258,147	17	175,385	12
Roaded natural	160,618	11	217,406	14
Rural	0	0	0	0
Total	1,487,871	100	1,487,871	100

Motorized Winter Recreation

Some kinds of winter recreational activities cause loss of habitat, behavioral responses to human disturbance, or snow compaction. Studies in Colorado of lynx and winter recreators showed that lynx do not avoid winter recreation until it gets more intensive (Olson et al. 2018) and suggests lynx are generally tolerant of human activities. A variety of behavioral responses may be expected from individual lynx and in different contexts (Interagency Lynx Biology Team 2013). Olson developed an Idaho Standard off road Snowmobile model to represent areas which snowmobilers may select (Grizzly Bear section provides more information). While winter motorized recreation can occur across all lynx habitat, accessibility is based on the recreation opportunity spectrum limits both the distribution and intensity of recreation and may vary seasonally. For example, mechanized recreation not allowed in designated wilderness, so winter recreation is limited to foot or horseback.

Squires et al. (2019) studied lynx habitat use concurrently with snowmobile recreation. They distributed global positioning system (GPS) units to winter recreationists engaged in motorized and nonmotorized winter sports and deployed GPS radio collars on adult Canada lynx that were resident in the areas that attracted high levels of dispersed winter recreation. Results indicated that resource-selection models (RSFs) for Canada lynx were significantly improved when selection patterns of winter recreationists were included in best-performing models. Canada lynx and winter recreationists partitioned environmental gradients in ways that reduced the potential for recreation-related disturbance. Although the inclusion of recreation improved the RSF model for Canada lynx, environmental covariates explained most variation in resource use. The environmental gradients that most separated areas selected by Canada lynx from those used by recreationists were forest canopy closure, road density, and slope. Canada lynx also exhibited a functional response of increased avoidance of areas selected by motorized winter recreationists (snowmobiling off-trail, hybrid snowmobile) compared with either no functional response (hybrid ski) or selection for (backcountry skiing) areas suitable for nonmotorized winter recreation.

At the time of the Northern Rockies Lynx Management Direction (2007d) the Clearwater and Nez Perce Forests estimated approximately 500 and 1,075 miles of groomed or designated routes in lynx habitat, respectively. Of that, 425 miles on the Clearwater and 275 miles on the Nez Perce were estimated to be groomed annually (table 60).

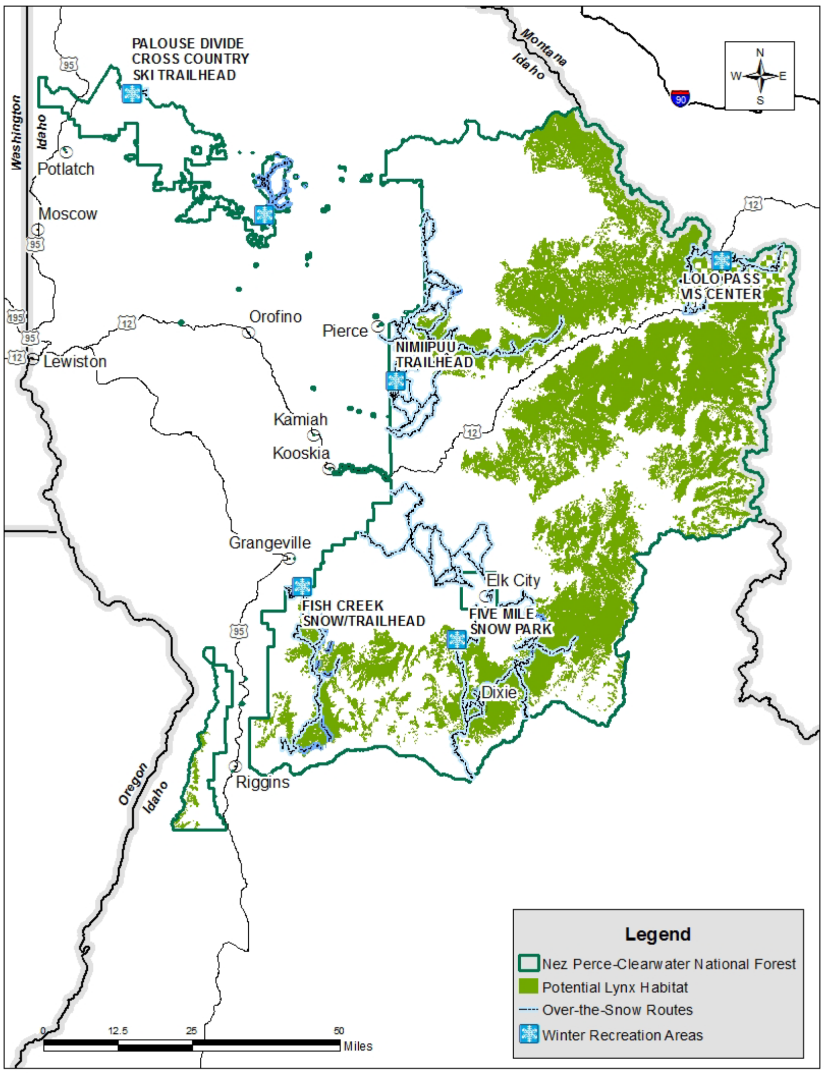


Figure 29. Current groomed snowmobile routes and cross-country ski trails

Currently, there are four groomed snowmobile trail systems on the Nez Perce-Clearwater, including the Fish Creek Recreation Area; Lolo Pass and the Powell area; Elk City and the Dixie area; and the Elk River Snowmobile Trail system. Five groomed Nordic ski trail systems provide primitive and semi-primitive non-motorized opportunities at Fish Creek Recreation Area, Musselshell Meadows, Lolo Pass, Elk River Nordic Ski Trails, and Palouse Divide Nordic Ski Area. Currently there are a total of approximately 667 miles of motorized over-the-snow routes within lynx analysis units on the occupied portion of the Forest, with approximately 117 miles groomed annually. There are approximately 911 miles of designated motorized over-the-snow routes within lynx analysis units on the unoccupied portion of the Forest, approximately 164 miles of which are groomed annually (figure 29). Actual total groomed miles, and miles groomed annually, are substantially less that those that were estimated for NRLMD (Table 60).

In 2017 the Clearwater National Forest issued the decision for its motorized winter recreation plan, as part of the Clearwater Travel Plan (2017). The decision clarified where, when, and under what conditions motorized over-snow vehicles are allowable on the Clearwater National Forest. The decision abided by Northern Rockies Lynx Management Direction Guideline for Human Use (HU) G11 by not expanding over-the-snow routes outside the baseline areas of consistent snow compaction.

Table 60. Miles of designated or groomed winter routes and acres of designated play areas (NRLMD Appendix K).

Forest	Forestwide groomed or designated routes, in miles	Inside Lynx Habitat Groomed or designated routes, in miles	Inside Lynx Habitat Average designated routes groomed/year, in miles	Inside Lynx Habitat Designated routes that could be groomed, in miles	Inside Lynx Habitat Designated play areas (Number) and acres
Clearwater	1,025	500	425	75	0
Nez Perce	2,275	1,075	275	775	0
Totals	3,300	1,575	700	850	0

As a result, motorized winter use on the Clearwater National Forest is consistent with the Northern Rockies Lynx Management Direction guidelines. The Nez Perce National Forest has not yet undergone travel planning for motorized winter recreation. As a result, currently, all areas that are not designated wilderness are open to motorized over-snow travel and there are no designated play areas nor designated over-the-snow routes on this portion of the Forest.

Although the Nez Perce-Clearwater is closed to lynx trapping, a potential indirect effect of motorized over-snow vehicle use is that it could facilitate access to lynx habitat and increase the vulnerability of lynx to incidental trapping or illegal shooting. Motorized over-snow vehicles provide access for trapping of other furbearers, which has the potential to increase the risk of incidental trapping of lynx; however, actual occurrences of incidental trapping of a lynx in Idaho is a rare event and usually results in live release and is not known to result in substantive short or long-term effects resulting in fatalities.

Minerals

Minerals and energy exploration and development can affect lynx habitat and contribute to fragmentation though the level of impact is dependent on size of the operation or development (Interagency Lynx Biology Team 2013). Generally, on the Forest, most of the mineral developments are for locatable minerals (i.e., found close to the surface) which involve test pits or drill holes to explore for, and determine the quality of, mineralization. Generally, areas developed for locatable mineral exploration vary in size but are relatively small (up to tens of acres).

Locatable

Locatable minerals are those that may be “located” with a mining claim under mining law. There are four types of claims: lode, placer, millsite, and tunnel. Locatable minerals include, but are not limited to, gold, silver, copper, lead, zinc, platinum, precious gems, uranium, bentonite, and chemical grade limestone. Lands that are open to location under the Mining Law of 1872 guarantee U.S. citizens the right to prospect and explore lands reserved from the public domain and open to mineral entry. The right of access for exploration and development of locatable mineral is guaranteed.

Discovery of placer gold occurred in the late 1850s and these deposits were mined extensively in the early 1860s. Small-scale and medium-scale sized placer and dredging operations mined and then reworked the deposits in many locations on lands contained within the Nez Perce-Clearwater through the 1940s. Lode discoveries were mined by moderately sized surface and underground operations during this same period. Generally, growth in locatable exploration and mining development remained flat after the 1940s because of the closure of gold mines by the War Production Board in 1942. Higher gold prices renewed interest and mining development on the Nez Perce-Clearwater in the 1980s and then again in the early 2000s. Today, small-scale placer and dredging operations continue to be the dominate type of mining on the Nez Perce-Clearwater.

At present, the Nez Perce-Clearwater has approximately five approved Plans of Operations for small lode and placer mining and one approved exploration activity investigating larger deposits. Annually, the Nez Perce-Clearwater expects to administrate 40 to 50 Plans of Operation for suction dredging and receives 20 to 30 Notices of Intent. Notices of Intent generally propose small-scale mineral exploration activities that range from mineral prospecting with hand tools to small-scale placer operations. Currently, there are no large or medium sized mines operating on the Nez Perce-Clearwater. However, because of new technology in mineral exploration and mining techniques, mineral deposits once considered below grade could become in demand and the potential for mineral development would then increase.

Mineral Materials

Also known as salable minerals, mineral materials include common variety mineral materials, such as common varieties of sand, rock, stone, cinders, gravel, pumice, clay, most building stone, and other similar materials. The Forest Service has the authority to dispose of these materials on public lands through a variety of methods.

Mineral materials, such as gravel, riprap, and crushed aggregate, for road maintenance, road construction, recreation sites, and trailheads has been and will continue to be in use on the Nez Perce-Clearwater. Other mineral material uses include contract work, culvert replacement, and repair of damage caused by fire, floods, and landslides. The mineral materials utilized are primarily derived from Forest Service pits and quarries located in the planning area. The type, volume, and source of locations for in-service use varies year by year and according to need. Current mineral material exploration and development on the Nez Perce-Clearwater is low and is expected to remain the same or slightly increase as in-service projects develop or as these nonrenewable resources are depleted.

Leasable

According to the amended Mineral Leasing Act (2007a), leasable minerals include coal, phosphate, potassium, oil, oil shale, gas, and sodium resources that occur on public domain lands. The Mineral Leasing Act was amended to include minerals associated with lands acquired by the United States. The Geothermal Steam Act (1970) also incorporated geothermal resources. Additionally, locatable minerals on acquired lands may fall under the Mineral Leasing Act; however, their leasing is at the discretion of the Forest Service and is subject to all standards and guidelines for other resources.

At this time, there is no leasable mineral exploration or mining activity for coal, oil, or gas on the Nez Perce-Clearwater. Sources of nonrenewable energy are rated as having a very low mineral potential on the Nez Perce-Clearwater (National Energy Policy Development Group 2001). In general, interest in leasable mineral resources on the Nez Perce-Clearwater is low because of past unsuccessful attempts to locate and develop these resources. No exploration or development of other nonrenewable energy sources is expected during the 15 years.

Mineral resource activities are administered under the appropriate laws and regulations to ensure protection of surface resources while not unduly interfering with mining operations. The Forest provides for reasonable access for mineral prospecting, exploration, development, and production consistent with applicable direction from the current Forest Plan. Exploration and development of mineral resources is facilitated by providing timely responses to Notices of Intent and Operating Plans. Current emphasis is on working actively with operators to develop adequate mitigations for site-specific resource concerns and to obtain sufficient bonds to cover estimated reclamation needs. The frequency of inspections of ongoing operations is commensurate with their size and complexity, ensure adequacy of operating plans, and identify unforeseen environmental impacts. Reclamation of disturbed areas to a productive condition is required in all cases.

- There are approximately 3,500 active unpatented mining claims on the Nez Perce-Clearwater, filing and staking of additional claims tends to fluctuate with the value of certain mineral commodities, however, the trend is generally associated with the value of precious metals.
- Annually, the Nez Perce-Clearwater administrates Plans of Operation for 40 to 50 suction dredging operations, three to five placer or lode operations, and 20 to 30 Notices of Intent for mineral exploration.
- Small-scale placer and dredging operations continue to be the dominate type of mining on the Nez Perce-Clearwater and is evident because there are no active large or medium sized exploration or mining operations.
- The geology of the Nez Perce-Clearwater generally possesses a low- to high-grade mineralization in many areas. Mineralization could include precious metals, strategic rare earth element deposits or base metal deposits.

As stated in the Northern Rockies Lynx Management Direction, Human Use (HU) activities, including minerals and oil and gas exploration and development, should reduce impacts to lynx and lynx habitat. Guideline HU G4 encourages remote monitoring of mineral and energy development sites and facilities to reduce snow compaction. Guideline HU G5 addresses development of a reclamation plan to restore lynx habitat when mineral and energy development sites and facilities are closed. Guideline HU G12 limits winter access for non-recreation special uses and mineral and energy exploration and development to designated routes or designated over-the-snow routes. The application of these measures is expected to minimize adverse effects on lynx.

The continuous wilderness, wild and scenic river corridors, and recommended wilderness make it highly unlikely that a transmission corridor would be developed through the Nez Perce-Clearwater to support development of wind, solar, hydroelectric, or geothermal resources. Additionally, solar, wind, and geothermal renewable energy sources are rated as having a low potential across the Nez Perce-Clearwater. Development of these resources is not expected during the planning period.

The Secretary of the Interior has the authority to withdraw lands in federal ownership, effectively removing an area of federal land from settlement, sale, location, or entry for the purpose of limiting activities under those laws to maintain other public values in the area or reserving it for a particular public purpose or program. Withdrawals are also used to transfer jurisdiction over federal land from one department, bureau, or agency to another.

Many acres of National Forest System lands on the Nez Perce-Clearwater are withdrawn from mineral entry. Designated wilderness, Idaho Roadless Rule areas, wild and scenic rivers, and research natural areas have withdrawn or restricted mineral exploration. These areas represent approximately 1,224,093 acres (82 percent) of the lynx habitat on the Forest. Withdrawal of large areas of the Nez Perce-Clearwater from mineral development reduces the risk of habitat loss, disturbance, displacement, and mortality. All withdrawals are subject to valid existing rights. The Forest Service does not have the discretion to deny the right to exercise an outstanding mineral right. However, the developer does not have unrestricted rights because the developer's rights are limited to using only as much of the surface as is reasonably necessary to explore, develop, and transport materials. The developer must provide an operating plan to the Nez Perce-Clearwater. The Nez Perce-Clearwater has some ability to manage surface resources. Forest Service Manual 2832 provides direction for administration of an outstanding mineral rights.

Forest/Backcountry Roads

Forest/backcountry roads are generally low speed (less than 35 mph) single or double-lane gravel or paved roads. While construction of roads results in a reduction of lynx habitat, vegetation along less traveled roads may provide good snowshoe hare habitat and lynx may travel/forage along roads (Interagency Lynx Biology Team 2013).

Road construction results in a small reduction of lynx habitat by removing forest cover. Loss of habitat reduces available prey, increases competition, and fragments habitat which may cause increased home ranges and energy expenditure. On the other hand, if a road is closed, regrowth of dense vegetation may provide good snowshoe hare habitat, and lynx (and other predators) may use the roadbed for travel and foraging (Koehler and Brittell 1990). Extensive backtracking studies in Montana found that lynx did not avoid gravel forest roads (Squires et al. 2010). Trails are typically narrow routes with a native surface; there is no information to suggest that trails have negative impacts on lynx (Interagency Lynx Biology Team 2013).

On the Nez Perce-Clearwater, the majority of roads occur within the general management lands (i.e., MA 3, not in Wilderness or Idaho Roadless) and outside of lynx habitat. Most lynx habitat (82 percent of habitat Forestwide, 84 percent of habitat on the occupied portion of the Forest, and 80 percent of the habitat on the unoccupied portion of the Forest) is within Idaho Roadless Rule areas and Designated Wilderness where new road construction is prohibited. The reminder of lynx habitat, about 18 percent, occurs within these general management lands so most of the effects of roads on lynx and lynx habitat is limited to this area, though some existing roads do separate or are cherry stemmed into Designated Wilderness and Roadless areas. Within Roadless Rule areas, roads travel between roadless areas but are already established. The Forest Plan will not make any specific decisions on roads but establishes the setting governing future proposed roads.

Four Northern Rockies Lynx Management Direction guidelines limit the potential impacts of roads on lynx and lynx habitat:

- HU G6: Methods to avoid or reduce effects to lynx should be used in lynx habitat when upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development.
- HU G7: New permanent roads should not be built in areas important for lynx connectivity (ridgetops, saddles, forested stringers,).
- HU G8: Brushing along low-speed/low traffic roads should be done at the minimum necessary to provide public safety.

- HU G9: Public use should be restricted, and effective closures provided, on all new roads built for projects. Roads should be decommissioned/reclaimed after project is completed unless needed for other management activities.

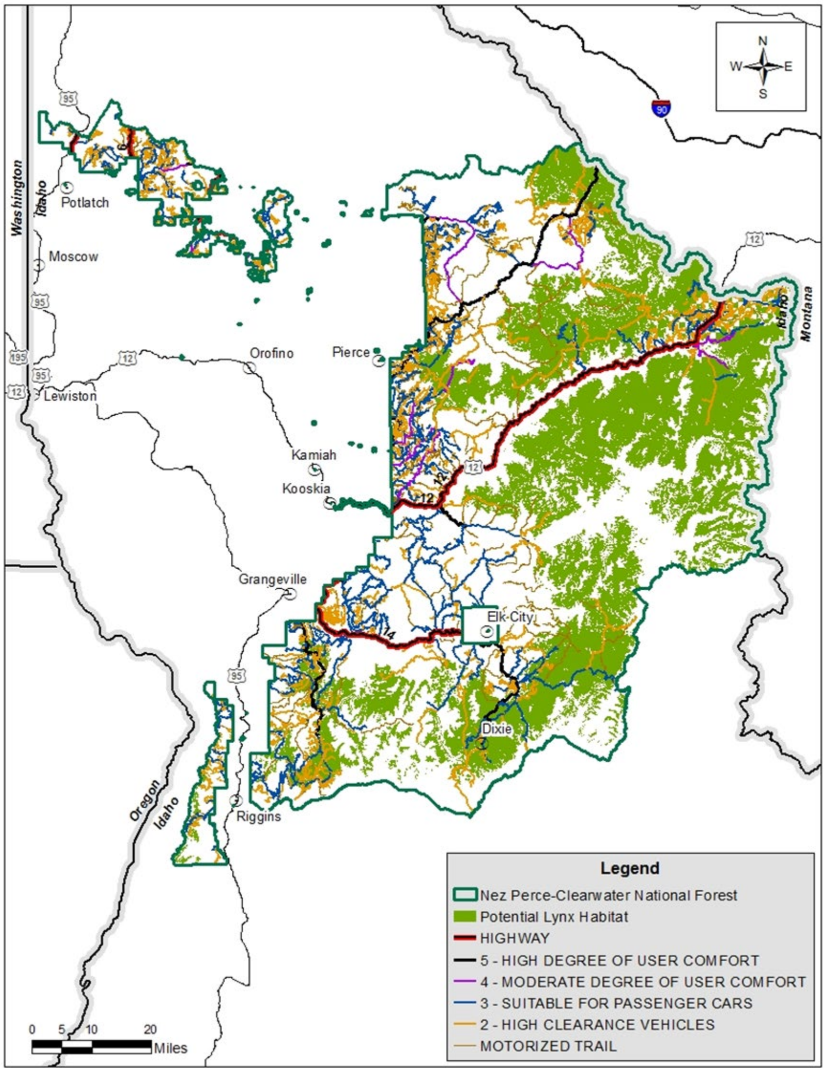


Figure 30. Highways, paved forest service roads, and motorized trails

Effects of Motorized Access on Mortality

Backcountry roads provide human access into lynx habitat where mortality may occur because of lynx being hit by motorized vehicles. Human access via Forest Service roads can increase potential for mortality or injury to lynx captured incidentally in traps aimed for other species or through illegal shooting. Mortalities of lynx due to vehicle collisions have been documented in Colorado, Minnesota, Maine, and in Montana (on highways) and Idaho. All these mortalities occurred on paved highways or high-speed gravel roads. The U.S. Fish and Wildlife Service determined that collisions are unlikely to occur on National Forest System roads, which are traveled at slower speeds and have lighter traffic volumes than highways (U.S. Department of the Interior 2017f). The longest paved roadways through the Forest are Highway 12 along the Lochsa River, Salmon River Road, portions of the Selway River Road, the 100 Road, and Highway 14 along the Southfork Clearwater River. Other paved roadways include Highway 8 and Highway 3 through limited portions of the Palouse District, where there is no modeled lynx habitat, and a few other portions of paved roads that end shortly after entering National Forest

System lands. Collectively paved road comprise approximately 45 miles in lynx habitat (figure 30). Highway 12 allows traffic speeds between 45 to 50 miles per hour so it may be possible on rare occasions for a lynx to be struck by a vehicle however this road has comparatively low traffic volumes and most of the road miles do not travel through lynx habitat. The overall impact from high-speed roads is low because these types of roads only travel through a limited portion of the plan area (small scope) and the severity is slight, impacting approximately 1.5 percent of the lynx habitat.

A potential indirect effect of motorized over-snow vehicle use is that it could facilitate access to lynx habitat and increase the vulnerability of lynx to incidental or accidental trapping or illegal shooting. Lynx harvest seasons closed due to listing in 2000 and trapping, snaring, and shooting of lynx is currently prohibited in the contiguous United States. In Idaho, trapping lynx has been prohibited since 1996. The Center for Biological Diversity versus Otter (No. 1: 14-CV-258-BLW) case expressed concerns about incidental trapping of lynx when targeting other fur bearers. However, between January 2012 and February 2014, there were four reported incidental trappings of lynx in Idaho. Three lynx were released alive while only one was mistaken for another species and killed by a hunter rather than the trap itself. None of the four incidents where lynx were incidentally trapped occurred in the Clearwater Region which includes the Nez Perce-Clearwater National Forests. During the 2020/2021 trapping season a single trapper reported catching two lynx in sets for bobcat near Highway 12 in Idaho County. Approximate reported locations puts these non-target trapping incidents on the Nez Perce-Clearwater National Forests within 15 miles of Lolo Pass.

The distribution of legal trapping is influenced by the distribution of roads. Save for a few areas, the distribution of roads influences winter travel because forested vegetation and topography makes over-snow travel difficult. About 83 percent of lynx habitat is within designated Wilderness or Idaho Roadless which makes accessibility to trappers more difficult. Wilderness prohibits mechanized travel, including over-snow vehicles. Similarly, Idaho Roadless Rule areas also make accessibility more challenging to trappers because of a lack of roads. So, while trapping is technically available in all lynx habitats the scope is limited because of limited accessibility. Because lynx trappings are exceedingly rare in Idaho, let alone in the plan area, and lynx mortalities from trapping are also uncommon when lynx are trapped, the severity, or the extent to which lynx populations would be reduced, is estimated as slight. The Forest has no information on lynx mortalities because of collisions with vehicles, incidental trapping, or illegal shooting.

As previously mentioned, the Nez Perce Forest has not completed winter travel planning and cross-country over-the-snow travel is not restricted on that portion of the Forest. The Clearwater National Forest Travel Plan had addressed cross-country over-the-snow travel and, while much of the Forest remains open to such activities, the Plan restricts eliminates over-the-snow travel in the Great Burn Recommended Wilderness area which provides connectivity between the Lolo and Clearwater National Forests along the Idaho/Montana state lines.

Livestock Grazing

Livestock are permitted to graze within the Nez Perce-Clearwater National Forests under the authority of the Granger-Thye Act of 1950, the Multiple-Use Sustained- Yield Act of 1960, and other federal laws and policies. Thirty-four permittees graze a total of 4,590 head of cattle on 612,766 acres within 36 active grazing allotments. In total there are 29,861 Animal Unit Months (AUM) on these active allotments. There are currently 9 vacant allotments. One permitted sheep allotment (2,304 permitted sheep numbers) is currently inactive due to incompatibility between domestic sheep and native big horn sheep. Active livestock grazing allotments comprise less than 15 percent of the Nez Perce-Clearwater National Forests administered lands. Much of forage capacity for livestock grazing within the Forests is considered transitory forage produced following reduction in conifer overstory associated with fire and timber harvest. Grazing allotments are managed to maintain sustained production of forage, while also meeting the needs of other forest resources, including riparian habitat, threatened and endangered species, native fisheries, wildlife, and recreation. Guidance to grazing permittees regarding management of an allotment is described in a formal Allotment Management Plan and Annual Operating Instructions. Allotment Management Plans are developed in conjunction with an interdisciplinary review and NEPA analysis of resource issues. Measures to mitigate any identified issues are specified in the Allotment Management Plan and Annual Operating Instructions. Following the listing of steelhead trout and Chinook salmon as threatened species, allotment management has emphasized protection and enhancement of riparian areas, with a focus on streams used by steelhead and salmon. Forest Service administrators routinely inspect grazing allotments for compliance with the objectives and standards specified in the Allotment Management Plan and Annual Operating Instructions.

Only about five percent of the lynx habitat in the plan area overlaps with active grazing allotments. All currently active allotments which overlap with lynx habitat fall within the unoccupied portion of the Forest. None of the allotments on the occupied portion of the Forest overlap with lynx habitat. Not all areas of allotments are grazed, and most multistory forest is not grazed because it does not produce enough forage for livestock. Grazing of transitory forage occurs in areas likely considered currently unsuitable habitat because it does not yet provide forage for snowshoe hares. This does not substantially delay recovery to point where it once again provides snowshoe hare habitat (i.e., stand initiation habitat).

Additionally, protection and enhancement of riparian areas provides habitat and connectivity within, and between, blocks of habitat.

Table 61. The amount of lynx habitat with active grazing allotments

Allotment Name	Allotment Acres	Status	Acres of Lynx Habitat within Allotment	Percent of Allotment
Allison-Berg	36,672	Active	6,308	17%
Butte Gospel	29,017	Active	22,261	57%
Cannonball	17,431	Active	4,983	19%
Cow Creek	29,054	Active	2,589	9%
Fiddle Creek	8,417	Active	1,253	15%
Florence	53,428	Vacant	27,681	52%
Hanover Mountain	15,472	Active	6,387	41%
Hungry Ridge	28,314	Active	6,218	20%
Mallard Creek	36,732	Vacant	32,987	89%
Papoose	12,995	Active	2,416	18%
Peter Ready	46,855	Active	13,246	28%
White Bird Creek	47,357	Active	6,967	21%

Table 62. Allotments acres overlap with lynx habitat

Allotments Acres Overlap with Lynx Habitat	Status	Percent of Allotment
72,627	Active	5%
60,668	Vacant	4%
133,295	Total	9%

There is little scientific information available about dietary overlap with, or competition between, livestock and snowshoe hares, or the response of snowshoe hares to livestock grazing. If there were significant forage competition, this could have an indirect impact on lynx by reducing its prey base. Overall, grazing or browsing by domestic livestock is unlikely to reduce the snowshoe hare prey base or have a substantial effect on lynx. However, grazing could have some localized effects on high-elevation willow communities or aspen stands if not managed appropriately. As a result, the NRMLD provides an objective and guidelines for managing grazing within occupied lynx habitat.

- GRAZ O1 - Manage livestock grazing to be compatible with improving or maintaining lynx habitat.
- GRAZ G1 - In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating.
- GRAZ G2 - In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen.
- GRAZ G3 - In riparian areas and willow carrs, livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.
- GRAZ G4 - In shrub-steppe habitats, livestock grazing should be managed in the elevation ranges of forested lynx habitat in lynx analysis units, to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.

Climate Change

The Northern Rockies Adaptation Partnership is a “science-management” collaboration with the goals of 1) assessing vulnerability of natural resources and ecosystem services to climate change and 2) developing science-based adaptation strategies that can be used by national forests to understand and mitigate the negative effects of climate change. The Northern Rockies region includes the U.S. Forest Service Northern Region 1 and the adjacent Greater Yellowstone area, spanning across northern Idaho, Montana, northwest Wyoming, North Dakota, and South Dakota. Five subregions are identified and assessed; the Nez Perce-Clearwater is in the Western Rockies subregion. The Climate Change Vulnerability and Adaptation in the Northern Rocky Mountains: Part 1 and Part 2 (Halofsky et al. 2018c;b) documents synthesize the best available scientific information relative to climate change relevant to the Northern Rockies area and is used as the best available science for assessing the effects of climate change. There have also been Forest-specific documents (A Climate Change Vulnerability Assessment for Resources of Nez Perce-Clearwater National Forests (EcoAdapt 2014), Climate Change Adaptation Strategies for Resources of the Nez Perce-Clearwater National Forests (EcoAdapt 2015), and the Nez Perce–Clearwater National Forests Forest Plan Assessment - Socioeconomic Climate Change Vulnerability Assessment (U.S. Department of Agriculture 2014b)) which also offer useful information.

The early 1900s were a relatively normalized period where warm and cool years were relatively equally represented and fluctuations fairly low. The following period until the 1940s was dominated by warm conditions, while the period from about 1950 to 1980 was dominated by cool conditions. During this cool period, ecological disturbances, such as wildfire, affected a relatively small area, although this was also influenced by human actions, such as fire suppression and livestock grazing. Since the 1980s, the Northern Region and the Nez Perce-Clearwater have experienced a warm cycle, along with increased extent and frequency of disturbances including wildfire and insect outbreaks. In the Western Rockies subregion, the Northern Rockies Adaptation Partnership found that from 1895 to 2012 the annual mean monthly minimum temperature increased by about 3.0 degrees Fahrenheit, while the annual mean monthly maximum temperature increased by about 0.6 degrees Fahrenheit. During the same period, the annual mean monthly precipitation increased slightly by an average of about 0.1 inch per month

(Halofsky et al. 2018c;b). Current climate conditions in this subregion include an annual mean monthly maximum temperature of approximately 53 degrees Fahrenheit; an annual mean monthly minimum temperature between 27- and 33-degrees Fahrenheit; and an annual precipitation between 35 and 40 inches (Halofsky et al. 2018c;b).

Different climate models project differing rates of change in temperature and precipitation because they operate at different scales, have different climate sensitivities, and incorporate feedbacks differently. However, the climate models are unanimous in projecting increasing average annual temperatures over the coming decades. The authors of the Northern Rockies Adaptation Partnership (NRAP) found that:

> *"Global climate models project that the Earth's current warming trend will continue throughout the 21st century in the Northern Rockies. Compared to observed historical temperature, average warming across the five NRAP subregions is projected to be about 4 to 5 °F by 2050, depending on greenhouse gas emissions. Precipitation may increase slightly in the winter, although the magnitude is uncertain. Climatic extremes are difficult to project, but they will probably be more common, driving biophysical changes in terrestrial and aquatic ecosystems. Droughts of increasing frequency and magnitude are expected in the future, promoting an increase in wildfire, insect outbreaks, and non-native species. These periodic disturbances, will rapidly alter productivity and structure of vegetation, potentially altering the distribution and abundance of dominant plant species and animal habitat (Halofsky et al. 2018c;b)."*

Halofsky et al. (2018c;b) further summarizes overall effects or climate changes in the Western Rockies, which includes the Nez Perce-Clearwater. Increases of five to ten degrees are predicted to increase monthly and annual mean temperatures across all seasons, with mean monthly winter maximum temperature rising above freezing. While more precipitation is expected for the winter (and spring) the increased temperatures will result in more of that precipitation falling in the form of rain rather than snow substantially changing spring runoff. Westerling et al. (2006) compiled information on large wildfires in the western United States from 1970 to 2004 and found that large wildfire activity increased suddenly and markedly in the mid-1980s with a higher frequency of large wildfires, longer wildfire durations, and longer wildfire seasons. The greatest increases occurred in mesic, mid-and high-elevation forest types in the northern Rocky Mountains. The same study found that fire exclusion (suppression) has had little impact on the natural fire regimes of these higher-elevation forest types in this area; instead, climate appears to be the primary driver of forest wildfire risk. Westerling (2016) and Morgan et al. (2008) also identify the mid-elevational areas located between 5,000 to 7,500 feet in the Northern Rockies as having the greatest risk of climate-induced fire increases in the region and have also found that the timing of spring snow-melt can drive the intensity of fires. Larger areas of severe fire are anticipated to skew the forested landscapes toward younger age classes and smaller trees.

The combined impacts of increasing wildfire, insect outbreaks, and tree diseases are already causing widespread tree die-off and are virtually certain to cause additional forest mortality by the 2040s and long-term transformation of forest landscapes. The trend will be toward more drought-tolerant species becoming more competitive. For species like subalpine fir and spruce this may mean an upward elevational shift into high elevation zones where heavy snow and cold previously prevented establishment of seedlings. However, these species are poorly adapted to fire so potential increases in fire and disease (especially effects of spruce beetles) may limit their abundance in the future. Lodgepole pine is expected to expand and contract but, generally, likely to remain present in a warmer climate if fire is not excluded, albeit in different areas (Halofsky et al. 2018b). As a result, it is expected that habitat for mammals that depend on high-elevation, snowy environments, including lynx and snowshoe hares may deteriorate relatively soon if snowpack continues to decrease. This could lead to a decrease in connectivity as southern populations become isolated (Halofsky et al. 2018c).

The Lynx Conservation Assessment and Strategy does not provide management recommendations specific to changing climate, although it did identify several information needs and possible effects on lynx as a result of future changes in climate have been hypothesized as:

- Potential upward shifts in elevation or latitudinal distribution of lynx and their prey.
- Changes in the periodicity of when snowshoe hares change color or loss of snowshoe hare cycles in the north.
- Reductions in the amount of lynx habitat and associated lynx population size due to changes in precipitation, particularly snow suitability and persistence, and changes in the frequency and pattern of disturbance events, such as fire and insect outbreaks.
- Changes in the demography of lynx, such as survival and reproduction rates.
- Changes in predator-prey relationships.

Effects of Forestwide Plan Components on Lynx and Lynx Habitat

This section considers the effects from implementation of the revised forest plan as guided by the plan components (objectives, desired conditions, suitability, standards, and guidelines applied forestwide or to management areas). This analysis addresses how the specific components targeted for Canada lynx, as well as key plan components not targeted for the Canada lynx, have the potential to affect its persistence and recovery.

As is typical of Forest Service land and resource management plans, the revised forest plan does not prescribe site-specific actions, and so this document does not provide an analysis of site-specific projects. Because this is a broad-scale analysis of actions that could potentially result in effects on the Canada lynx, its habitat, the Nez Perce-Clearwater National Forest is responsible for section 7 consultation on future projects (conducted under the revised forest plan). The forest plan was amended in 2007 to add Northern Rockies Lynx Management Direction objectives, standards, and guidelines that addressed the major threats to lynx and remedied the inadequacy of existing regulatory mechanisms. The Northern Rockies Lynx Management Direction addressed vegetation management, livestock management, human use projects (e.g., special uses, recreation management, roads, highways, and mineral/energy development), linkage areas, and some general direction that applies to all management practices and activities. The Biological Opinion for the Northern Rockies Lynx Management Direction stated, “We conclude, based on our entire analysis, that the proposed action would support lynx populations in core areas, and would not appreciably reduce the reproduction, numbers or distribution of lynx in the NRLA. The recovery outline for lynx (U.S. Department of the Interior 2005) presents our current understanding of historical and current lynx distribution, ecology, population dynamics, and the relative importance of different areas to the persistence of lynx in the contiguous United States. We have determined that the proposed action is compatible with our understanding of recovery needs for lynx in the contiguous United States DPS” (U.S. Department of the Interior 2007c). The effects to lynx that were described in the 2007 FEIS (volumes 1 and 2), biological assessment, biological opinion, and record of decision for the Northern Rockies Lynx Management Direction are incorporated by reference.

The plan direction emphasizes moving towards desired future conditions that contribute to ecological, social, and economic sustainability. The Revised Forest Plan retains the objectives, goals, standards, guidelines, and monitoring requirements from the Northern Rockies Lynx Management Direction in its entirety. The direction in the Northern Rockies Lynx Management Direction will be applied to projects occurring in occupied lynx habitat and considered when management activities are planned in unoccupied lynx habitat. The forestwide Northern Rockies Lynx Management Direction management direction is carried forward as part of the of the proposed action, with the following Forest Plan-specific modifications:

- Increase of exception acres for pre-commercial thinning for restoration of aspen, whitebark pine
- Adopt the County CWPP WUI boundaries for determination of where Fuels treatment wildland urban interface exemptions to Northern Rockies Lynx Management Direction Standards may be applied
- Adopt updated Lynx Analysis Unit Boundaries developed in 2014 to better align with modeled habitat
- Dropping the single lynx analysis unit at the southern end of "The Island"

The previous section presented risk factors and activities that can affect Canada lynx in the action area, some of which may also result from future actions undertaken as allowed by the proposed action. First, the effects section assesses allowable activities that can pose a risk to Canada lynx (the key stressors or anthropogenic influences identified in the 2013 Lynx Conservation Assessment and Strategy, discussed below). Effects are also put in context based upon the extent to which they are allowed under the existing forest plan versus the proposed action. Lastly, the cumulative effects are examined.

The anticipated effects of the proposed programmatic action are based upon:

- updates to the environmental baseline and best available science
- plan components in the revised forest plan
- updated estimates of the acres that would be treated with existing exceptions or exemptions to Northern Rockies Lynx Management Direction standards to reflect the expected 15-year life of the revised forest plan and an updated assessment of treatments needs
- areas and routes suitable for motorized over-snow use
- updated lynx analysis unit boundaries

Management Area Allocation

Table 63. Current distribution of lynx habitat by Management Area

Management Area	Acres	Proportion of Forestwide Lynx Habitat
Designated Wilderness	582,231	39%
Idaho Roadless Rule	641,862	43%
General Forest	263,778	18%
Total	1,487,871	100%

Table 64. Proposed distribution of lynx habitat by Management Area

Management Area	Acres	Proportion of Forestwide Lynx Habitat
MA-1	617,617	41%
MA-2	622,199	42%
MA-3	248,055	17%
Total	1,487,871	100%

There are three management areas defined under this forest plan revision. Changes in the distribution of lynx habitat within Management Areas is a result of the definitions and grouping applied to each Management Area.

Management Area 1 (MA1) contains areas designated by Congress and includes designated wilderness, designated wild and scenic rivers, and national historic landmarks and trails. Management Area 1 is managed to be consistent with the legislation for each area designation. Generally, these areas are part of the National Preservation System and are managed for preservation emphasis in which natural processes are the primary means of disturbance.

Management Area 2 (MA2) is referred to as the back-country area and contains areas designated by the executive branch, generally by the Secretary of Agriculture or the United States Forest Service. Designated areas within Management Area 2 include Idaho Roadless Rule areas, recommended wilderness, suitable wild and scenic rivers, the Gospel Hump multi-purpose area, designated Research Natural Areas, and proposed Natural Research Areas. These areas are managed consistent with rule or plan direction in which it was designated for. Some areas have specific direction spelled out, such as the Idaho Roadless Rule. Others are managed for a specific purpose solely based on forest plan direction. Generally, these lands are managed to preserve the characteristics or value for which they were designated, such as roadless character, outstandingly remarkable values, and areas for scientific research. Management often is a combination of letting natural processes dominate and promoting active management. The degree to which nature is allowed or how human influences effect change through management is variable with each sub-management area. Timber harvest is permitted in some portions of this management area, while prescribed fire is generally permissible across the management area. Some portions of Management Area 2 are suitable for timber harvest while others are unsuitable. No areas in Management Area 2 are suitable for timber production.

Management Area 3 (MA3) is referred to as the front-country and contains areas without special designation. Management Area 3 is managed for multiple uses within the constraints of forest practices, regulations, and laws and special management restrictions. Active management is the dominant disturbance agent in this management area. Within this management area, ecological, social, and economic factors are given equal weight. The land is managed under a conservation ethos and is managed consistent with the Forest Service mission statement. Timber harvest may be used to meet desired conditions of many resources. All areas suitable for timber production are within Management Area 3.

Desired Conditions

Acres of disturbance or restoration (harvest, prescribed fire, wildfire, etc.) required to achieve desired conditions within the preferred alternative timeframe would be between 54,000 and 64,500 acres annually. This is from harvest, prescribed fire, non-commercial fuels reduction treatments and naturally ignited wildfires that achieve land management plan objectives.

The revised forest plan uses modeled natural range of variability (NRV) across Management Areas and broad potential vegetation types (BPVTs) to determine desired range of dominance. Desired conditions in the cold and cool moist PVT types would, over time, direct management to reduce dominance types of Engelmann spruce and subalpine fir to other types (table 66, table 67, table 68, table 69 and table 70). As subalpine fir and Engelmann spruce dominance types decrease, lodgepole, western larch, whitebark pine, and white pine dominance types would increase over the long-term. Nevertheless, all the cool moist and cold potential vegetation types are considered potential lynx habitat and habitat even if the dominance type changes. Based upon preliminary modeling results, the plan components and alternatives would change about plus or minus two percent of the spruce-fir habitats into other types. A small percent change is expected in these types. While the dominance type may change, Engelmann spruce and subalpine fir will still be components of these stands and will move through succession through time to provide for optimal snowshoe hare winter habitat and thus lynx winter forage.

Table 65. Current dominance types and desired range within management area 1 in the cold broad PVTs

Dominance Type	NRV	Current Condition[1]	Desired Range	Relative Importance to Lynx
Lodgepole Pine	31-38%	28%	30-40%	Primary Habitat
Subalpine fir/Engelmann Spruce	2-8%	35%	3-10%	Primary Habitat
Whitebark pine	0%	0%	35-50%	Not Habitat – Too high
Douglas fir/Western larch	0%	4%	0-5%	Secondary Habitat
Mountain hemlock	0%	0%	2-5%	Secondary Habitat
Seral grass/shrub	1-20%	23%	5-15%	Not Habitat

[1]Current conditions are based on the proportion of the potential vegetation type group and Management Area that is classified as a "tree" lifeform. The total does not sum to 100 percent due to rounding and some nondescript classifications, such as "intolerant mix."

Table 66. Current dominance types and desired range within management area 2 in the cold broad PVT

Dominance Type	NRV	Current Condition[1]	Desired Range	Relative Importance to Lynx
Lodgepole Pine	36-45%	34%	30-35%	Primary Habitat
Subalpine fir/Engelmann Spruce	2-6%	26%	5-15%	Primary Habitat
Whitebark pine	0%	2%	35-50%	Not Habitat – Too high
Douglas fir/Western larch	0%	0%	0-5%	Secondary Habitat
Mountain hemlock	0%	22%	0-5%	Secondary Habitat
Seral grass/shrub	1-23%	16%	5-15%	Not Habitat

[1]Current conditions are based on the proportion of the potential vegetation type group and Management Area that is classified as a "tree" lifeform. The total does not sum to 100 percent due to rounding and some nondescript classifications, such as "intolerant mix."

Table 67. Current dominance types and desired range within management area 3 in the cold broad PVT

Dominance Type	NRV	Current Condition[1]	Desired Range	Relative Importance to Lynx
Lodgepole Pine	37-49%	56%	30-40%	Primary Habitat
Subalpine fir/Engelmann Spruce	1-7%	26%	3-10%	Primary Habitat
Whitebark pine	0%	0%	35-50%	Not Habitat – Too high
Douglas fir/Western larch	0%	6%	0-5%	Secondary Habitat
Mountain hemlock	0%	0%	2-5%	Secondary Habitat
Seral grass/shrub	1-28%	14%	5-15%	Not Habitat

[1]Current conditions are based on the proportion of the potential vegetation type group and Management Area that is classified as a "tree" lifeform. The total does not sum to 100 percent due to rounding and some nondescript classifications, such as "intolerant mix."

Table 68. Current dominance types and desired range within management area 1 in the cool moist broad PVT

Dominance Type	NRV	Current Condition[1]	Desired Range	Relative Importance to Lynx
Lodgepole Pine	26-43%	10%	20-30%	Primary Habitat
Subalpine fir/Engelmann Spruce	31-55%	53%	25-40%	Primary Habitat
Whitebark pine	0%	0%	2-10%	Not Habitat – Too high
Douglas fir	4-6%	7%	2-4%	Secondary Habitat
Western larch	0%	0%	5-10%	Secondary Habitat
Douglas fir/Western larch	0%	1%	1-2%	Secondary Habitat
Grand fir/Mountain hemlock	0%	1%	1-2%	Secondary Habitat
Western white pine	0%	0%	5-10%	Secondary Habitat
Seral grass/shrub	0%	28%	5-25%	Not Habitat

[1]Current conditions are based on the proportion of the potential vegetation type group and Management Area that is classified as a "tree" lifeform. The total does not sum to 100 percent due to rounding and some nondescript classifications, such as "intolerant mix."

Table 69. Current dominance types and desired range within Management Area 2 in the cool moist broad PVT

Dominance Type	NRV	Current Condition[1]	Desired Range	Relative Importance to Lynx
Lodgepole Pine	25-38%	19%	20-30%	Primary Habitat
Subalpine fir/Engelmann Spruce	29-62%	41%	25-40%	Primary Habitat
Whitebark pine	0%	1%	2-10%	Not Habitat – Too high
Douglas fir	3-4%	10%	2-4%	Secondary Habitat
Western larch	0%	3%	5-10%	Secondary Habitat
Douglas fir/Western larch	0%	2%	1-2%	Secondary Habitat
Grand fir/Mountain hemlock	0%	9%	1-2%	Secondary Habitat
Western white pine	0%	0%	5-10%	Secondary Habitat
Seral grass/shrub	0%	16%	5-25%	Not Habitat

[1]Current conditions are based on the proportion of the potential vegetation type group and Management Area that is classified as a "tree" lifeform. The total does not sum to 100 percent due to rounding and some nondescript classifications, such as "intolerant mix."

Table 70. Current dominance types and desired range within Management Area 3 in the cool moist broad PVT

Dominance Type	NRV	Current Condition[1]	Desired Range	Relative Importance to Lynx
Lodgepole Pine	26-38%	12%	20-30%	Primary Habitat
Subalpine fir/Engelmann Spruce	27-58%	60%	25-35%	Primary Habitat
Whitebark pine	0%	0%	2-10%	Not Habitat – Too high
Douglas fir	5-7%	3%	2-4%	Secondary Habitat
Western larch	0%	4%	5-10%	Secondary Habitat
Grand fir/Mountain hemlock	0%	9%	1-2%	Secondary Habitat
Western white pine	0%	0%	5-15%	Secondary Habitat
Seral grass/shrub	0%	10%	5-25%	Not Habitat

[1]Current conditions are based on the proportion of the potential vegetation type group and Management Area that is classified as a "tree" lifeform. The total does not sum to 100 percent due to rounding and some nondescript classifications, such as "intolerant mix."

Dominance type is determined by the species with the greatest abundance of canopy cover, basal area, or trees per acre within a setting or map feature. The species that determine the dominance type are always of the same lifeform. Therefore, it is necessary to first identify the dominant lifeform and tree lifeform subclass before determining dominance type (Barber et al. 2011).

Historically, western white pine was the most important forest cover type in North Idaho, occupying the region's cooler moister sites in elevations between 2,000 and 5,500 ft. (Haig 1932). Because of the shade intolerance of western white pine, successful fire suppression efforts in the 1900s discouraged the continued reproduction of white pine, as did the introduction of white pine blister rust. Due to the lack of stand replacing disturbances and lack of naturally occurring blister rust resistant seed sources on the landscape, western white pine is being supplanted by more shade tolerant and more disease susceptible species, including grand fir and Douglas fir (Fins et al. 2001). Site specific observations in the project area verify these general observations made by Fins et al. In the stands proposed for vegetation management, the most abundant species are shade tolerant species rather than long-lived early seral species, such as western white pine, ponderosa pine, or western larch.

Currently, the plan area is dominated by mid and late seral species, such as grand fir (*Abies grandis*), subalpine fir, and Engelmann spruce dominance types. Many of these areas would have historically been dominated by long-lived early seral species, such as ponderosa pine, western larch (Larix occidentalis), western white pine, and whitebark pine.

In the Cold BPVT the anticipated changes in dominance of subalpine fir and Engelmann spruce will largely be a result of projected increases in whitebark pine dominance. Subalpine fir and Engelmann spruce dominance in the cool moist BVPT will decrease however will remain principal cover type in the BPVT followed closely by lodgepole pine due to anticipated increases in that species dominance. Natural disturbances (wildfire, prescribed fire) will be the main cause of change in Management Areas 1 and 2 which involves approximately 83 percent of the lynx habitat on the Forest (table 50). Anthropogenic drivers such as timber harvest, as well as natural disturbances (prescribed and wildfire) will be the main causes of dominance change in Management Area 3 which hold approximately 18 percent of the lynx habitat.

Under the 2012 planning rule, actions must be consistent with the plan components in the revised plan. A project will be consistent with desired conditions in the plan when "projects or activities contributes to the maintenance or attainment of one or more goals, desired conditions, or objectives, or does not foreclose the opportunity to maintain or achieve any goals, desired conditions, or objectives, over the long term"

(36 CFR 219.15). A guideline under the 2012 Planning Rule is “a constraint on project and activity decision making that allows for departure from its terms, so long as the purpose of the guideline is met” (2012 Planning Rule). Consistency with the plan is achieved when either the project or activity complies with the guideline or is designed in a way that is as effective in achieving the purpose of the applicable guidelines (36 CFR 219.15).

The revised forest plan would retain the direction from the Northern Rockies Lynx Management Direction as amended to the Clearwater and Nez Perce Forest Plans in 2007. The effects to lynx that were described in the Northern Rockies Lynx Management Direction Final Environmental Impact Statement (FEIS) Volumes 1 and 2, biological assessment, biological opinion, and record of decision are incorporated by reference. Continued implementation of the forest plan is anticipated to maintain or improve lynx habitat in the long-term, although some short-term adverse effects may occur, primarily due to the reduction of snowshoe hare habitat allowed under the exceptions and exemptions to the vegetation standards. As a whole, the revised forest plan direction will promote conservation of the lynx and lynx habitat.

Key Indicators for Analysis

The revised Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team 2013) identifies anthropogenic influences on lynx and lynx habitat, described in two tiers. First tier anthropogenic influences can directly affect both snowshoe hare and lynx populations. First tier factors include vegetation management, wildland fire management, habitat fragmentation, and climate change. Second tier anthropogenic influences include those that research and management experience has shown to be less likely to have substantial effects to lynx and their habitat. Second tier factors include incidental trapping, recreation, mineral and energy exploration and development, illegal shooting, backcountry roads and trails, and domestic livestock grazing (Interagency Lynx Biology Team 2013).

Table 71. Key indicators for assessing effects to Canada lynx

Resource element	Indicator
Vegetation management	Terrestrial ecosystems and Canada lynx habitat diversity. Amount of lynx habitat suitable for timber production. Changes in vegetation conditions modeled in SIMPPLLE.
Fire management	The amount of lynx habitat through time susceptible to uncharacteristic wildfire under future climates. Changes in vegetation conditions modeled in SIMPPLLE.
Habitat fragmentation	Anticipated changes to Canada lynx habitat connectivity linkage areas.
Recreation	Suitability for motorized over-snow vehicle use and Canada lynx habitat from winter recreation opportunity spectrum.
Minerals	Distribution or suitability of minerals operations in Canada lynx habitat
Forest/Backcountry Roads	Effects of motorized use on Forest/backcountry roads and indirect effects of motorized access on the risk of trapping and shooting
Livestock Grazing	Livestock grazing and vegetation change in Canada lynx habitat
Climate Change	Anticipated changes in climate and effects on Canada lynx habitat

Vegetation Management

Standards and guidelines carried forward from the 2007 Northern Rockies Lynx Management Direction (FW-STD-WL-01) will continue provide overarching direction for many aspects of land management. The vegetation management standards and guidelines work together to promote the vegetation management objectives. In addition to the vegetation management standards, standard ALL S1 also applies to vegetation management projects in that vegetation management projects must maintain habitat connectivity in a lynx analysis unit and/or linkage area. Having this standard apply to each lynx analysis unit (which represents a lynx home range) would maintain connectivity among lynx analysis units and throughout the larger landscape, thus minimizing the potential impacts to habitat connectivity and linkage areas from vegetation management. Site-specific projects are not likely to impede lynx movement or reduce habitat connectivity. We do not expect habitat connectivity or linkage to be adversely affected from vegetation management projects conducted under the revised forest plan. However, vegetation management activities proposed under the revised forest plan may result in some level of disturbance effects to lynx if lynx are in the project area during project implementation. Such disturbance is expected to be insignificant as areas free of disturbance are typically available if a lynx needed to adjust movement patterns during implementation.

These constraints were programed into the preferred alternative thus, levels of treatments are designed to meet the Northern Rockies Lynx Management Direction guidelines. During modeling, the Northern Rockies Lynx Management Direction constraints maintained subalpine fir/Engelmann spruce dominance types despite the desired condition ranges.

Desired conditions for lynx habitat and vegetation standards VEG S1, VEG S2, VEG S5, and VEG S6 support conservation of Canada lynx and their habitat. Exceptions and exemptions to the standards allow for activities to occur to meet social, economic, and multiple-use objectives of the Forest while promoting recovery of the Canada lynx population on the Forest.

The revised forest plan proposes to adopt updated lynx analysis unit boundaries which will only change the proportions of different habitat conditions within lynx analysis units, not proportions of overall Forestwide allocations of habitat types (VEG S1).

The revised forest plan is also proposing to adopt Community Wildfire Protect Plan (CWPP)PP wildland urban interface (WUI) boundaries, this changes where exemptions to VEG S1, VEG S2, VEG S5, and VEG S6 may be applied. The change to the CWPP WUI boundaries would provide flexibility when planning fuels reduction projects and align them with county designations. It would not increase the total exemptions acres above the six percent analyzed under the U.S. Fish and Wildlife Service Incidental Take Statement (Wildfire, Fire Suppression, Fire Management, and Fuels Management).

Lastly, is the proposal to expanded potential acres of pre-commerical thinning (PCT) in lynx habitat which is excepted from Northern Rockies Lynx Management Direction to meet future desired conditions for Western white pine, whitebark pine, and aspen (see VEG S5 below).

Objectives VEG O1, VEG O2, and VEG O4 encourage management of vegetation to mimic or approximate natural succession and disturbance processes while maintaining lynx habitat components. Under the action alternative, Forest Plan components promoting multi-story spruce/fir where it exists within the various management areas and associated PVTs, as well as the landscape patterns and patch sizes based on natural range of variability, would be met at the forestwide scale and would benefit lynx by creating or sustaining desired habitat conditions (see summary table at end of document).

Guideline G1 encourages development of projects that are designed to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Guideline VEG G5 is to provide habitat for alternative prey species, particularly red squirrel, in each lynx analysis unit. Guideline VEG G10 states that all the vegetation standards should be considered when designing fuel treatment projects within the wildland urban interface to promote lynx conservation and should be explained in the project NEPA. Guideline VEG G11 describes how denning habitat should be retained and distributed in each lynx analysis unit. These guidelines benefit lynx by encouraging management that creates or maintains lynx habitat components, and they would continue to be considered in the site-specific design of projects under this alternative.

The following discussion summarizes and paraphrases the effects of the Forest's plan components for Canada lynx, which carry forward objectives, standards, and guidelines from the Northern Rockies Lynx Management Direction.

Effects of Plan on Vegetation Standards

VEG S1

Under Standard VEG S1, if more than 30 percent of lynx habitat in a lynx analysis unit is in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects, with certain exceptions or exemptions allowed under the Incidental Take Statement (Wildfire, Fire Suppression, Fire Management, and Fuels Management section for proposed exemptions to this Standard). Limiting further regeneration harvest in lynx analysis units that do not meet all of the VEG S1 exemption requirements until vegetation regrows into snowshoe hare habitat will help to support lynx by maintaining a mosaic of habitat, as called for under VEG O2, so that a lynx is more likely to be able to access sufficient prey resources within its home range.

In summary all Management Areas and the BPVTs which contribute the greatest potential to develop lynx and snowshoe hare habitat, will be managed to provide a distribution of size classes and patch sizes representative of historic fire regimes. Within Management Area 3 that landscape will be managed for a mosaic of patches of different size classes. However, consistent with this standard, no regeneration harvest would occur in lynx analysis units where over 30 percent the lynx habitat is in ESISS which does not yet provide winter snowshoe hare habitat.

In summary all Management Areas, and the BPVTs which contribute the greatest potential to develop lynx and snowshoe hare habitat, will be managed to provide a distribution of size classes and patch sizes representative of historic fire regimes and considering future climate projections. Within Management Area 3 that landscape will be managed for a mosaic of patches of different size classes.

Proposed changes to lynx analysis unit boundaries affecting distribution of currently/temporarily unsuitable habitat

New lynx analysis unit boundaries were developed in 2014 as part of the Forest Plan Revision Process, and in consultation with the Regional Office (NRLMD Standard LAU S1) to better align with the updated habitat model. The proposal would reduce the number of lynx analysis units from 106 currently to 79 (37 in occupied habitat, 39 in unoccupied habitat, and 3 which overlap occupied/unoccupied habitat). Under previous lynx analysis unit boundaries, one lynx analysis unit exceeded 30 percent currently/temporarily unsuitable habitat and an additional nine lynx analysis units were above 20 percent while several did not contain any lynx habitat. Under the new lynx analysis unit boundaries two of the lynx analysis units are above 30 percent temporarily unsuitable and potential lynx habitat is at or above 20 percent temporarily unsuitable. The majority of these lynx analysis units are either partially or wholly within MA1 or MA2 with minimal overlap into MA3. Also, under the new lynx analysis unit boundaries there are no "empty" lynx analysis units.

Table 72. Temporarily unsuitable habitat by LAU using updated habitat and LAU boundaries ([1]CLW = Clearwater (Occupied) portion of the Forest, NEZ = Nez Perce (Unoccupied) portion of the Forest)

Forest[1]	LAU	LAU Acres	CUS	DEN	GEN	Total Habitat	%CUS	Acres to 30%	Management Area
NEZ	2070402	57,001	2,362	3,684	4,761	10,807	22%	880	Completely within Frank Church River of No Return Wilderness.
NEZ	2070601	23,088	5,708	8,223	6,449	20,380	28%	406	East Meadow Creek IRA (Primitive). Some Frank Church River of No Return Wilderness and West Meadow Creek IRA (Backcountry Restoration).
NEZ	2070603	36,655	4,846	6,366	6,801	18,013	27%	558	Mostly Frank Church River of No Return Wilderness. Some Mallard IRA (Backcountry Restoration), and East Meadow Creek IRA (Primitive)
NEZ	2070702	36,539	4,874	5,659	20,620	31,153	16%	4,472	No data
NEZ	2070707	49,585	1,405	9,742	12,188	23,335	6%	5,596	No data
NEZ	2070901	17,456	1,055	3,310	11,531	15,896	7%	3,714	No data
NEZ	2070902	17,990	3,301	1,470	6,607	11,378	29%	113	Mostly MA-3 (about 50%), remainder Dixie Summit-Nut Hill IRA (Forest Plan Special Area and Backcountry Restoration) and Adjacent to Gospel Hump Wilderness IRA (Backcountry Restoration), and Gospel Hump Wilderness.
NEZ	2070903	68,537	954	6,201	8,270	15,425	6%	3,674	No data
NEZ	2071001	34,920	927	4,167	20,778	25,872	4%	6,835	No data
NEZ	2071104	62,141	828	2,605	10,269	13,702	6%	3,283	No data
NEZ	2090402	30,977	1,458	4,987	5,919	12,364	12%	2,251	No data
NEZ	2090601	39,176	871	13,058	10,869	24,798	4%	6,568	No data
NEZ	2100403	56,264	1,141	2,224	6,623	9,988	11%	1,855	No data
NEZ	3010501	24,368	1,859	9,262	7,510	18,631	10%	3,730	No data
NEZ	3010601	13,552	105	2,388	6,229	8,722	1%	2,512	No data
NEZ	3010602	23,777	59	3,073	8,012	11,144	1%	3,284	No data
NEZ	3010604	21,329	644	5,239	5,964	11,847	5%	2,910	No data
NEZ	3010606	42,925	78	5,171	10,521	15,770	0%	4,653	No data
NEZ	3010701	31,450	1,552	8,277	7,597	17,426	9%	3,676	No data
NEZ	3010704	55,671	991	10,236	10,684	21,911	5%	5,582	No data
NEZ	3010705	46,193	500	5,546	8,243	14,289	3%	3,787	No data
NEZ	3020101	21,621	504	2,448	8,240	11,192	5%	2,854	No data

Forest[1]	LAU	LAU Acres	CUS	DEN	GEN	Total Habitat	%CUS	Acres to 30%	Management Area
BOTH	3020102	22,452	2,036	3,988	6,787	12,811	16%	1,808	No data
BOTH	3020103	20,936	1,293	5,759	8,513	15,565	8%	3,377	No data
NEZ	3020104	35,691	885	7,755	9,850	18,490	5%	4,662	No data
NEZ	3020105	21,294	1,426	3,497	11,860	16,783	8%	3,609	No data
NEZ	3020106	25,903	4,111	6,242	12,001	22,354	18%	2,595	No data
NEZ	3020108	36,403	1,545	10,958	17,379	29,882	5%	7,419	No data
NEZ	3020110	26,890	1,875	3,763	8,657	14,295	13%	2,414	No data
NEZ	3020201	20,991	335	5,876	6,247	12,458	3%	3,402	No data
NEZ	3020203	56,489	1,126	11,269	11,505	23,900	5%	6,044	No data
NEZ	3020206	46,666	1,108	10,082	4,445	15,635	7%	3,583	No data
NEZ	3020301	24,077	5,438	4,650	13,143	23,231	23%	1,532	Mostly West Meadow Creek IRA (Backcountry Restoration), some MA3 and a smaller portion of Frank Church River of No Return Wilderness.
NEZ	3020302	22,357	1,354	6,376	10,258	17,988	8%	4,042	No data
NEZ	3020305	38,706	133	11,633	12,538	24,304	1%	7,158	No data
NEZ	3020401	52,615	241	3,199	23,805	27,245	1%	7,932	No data
CLW	3030102	26,149	792	4,308	6,741	11,841	7%	2,760	No data
CLW	3030103	25,841	53	5,045	8,955	14,053	0%	4,163	No data
CLW	3030104	19,449	1,738	1,956	13,755	17,449	10%	3,497	No data
CLW	3030105	16,033	943	2,993	9,103	13,039	7%	2,968	No data
CLW	3030106	17,440	433	4,150	4,559	9,142	5%	2,309	No data
CLW	3030201	17,368	1,208	4,432	7,338	12,978	9%	2,685	No data
CLW	3030202	10,518	2,380	3,736	1,683	7,799	31%	-41	Completely within the Selway-Bitterroot Wilderness
CLW	3030203	24,757	2,742	5,642	6,205	14,589	19%	1,635	No data
CLW	3030204	24,498	5,431	5,332	11,960	22,723	24%	1,386	Equal parts Selway-Bitterroot Wilderness, Sneakfoot Meadows IRA (Primitive and Wild Land Recreation), and North Fork Spruce - White Sand IRA (Primitive).
CLW	3030205	22,562	1,356	3,392	13,722	18,470	7%	4,185	No data
CLW	3030206	10,811	3,065	1,376	4,371	8,812	35%	-421	Mostly Selway-Bitterroot Wilderness. Remainder; North Fork Spruce - White Sand IRA (Backcountry Restoration), North Fork Spruce - White Sand IRA (Wildland Recreation), and North Fork Spruce - White Sand IRA (Primitive)

Forest[1]	LAU	LAU Acres	CUS	DEN	GEN	Total Habitat	%CUS	Acres to 30%	Management Area
CLW	3030207	32,707	3,010	9,202	12,955	25,167	12%	4,540	No data
CLW	3030208	18,842	182	5,220	6,936	12,338	1%	3,519	No data
LW	3030301	27,532	764	4,995	10,454	16,213	5%	4,100	No data
CLW	3030303	45,697	622	10,529	9,911	21,062	3%	5,696	No data
CLW	3030401	13,787	2,134	2,878	6,398	11,410	19%	1,289	No data
CLW	3030402	12,561	75	1,556	8,984	10,615	1%	3,110	No data
CLW	3030403	25,447	2,187	5,001	11,313	18,501	12%	3,363	No data
CLW	3030502	33,312	5,056	9,201	13,398	27,655	18%	3,240	No data
CLW	3030504	32,027	0	2,935	10,425	13,360	0%	4,008	No data
CLW	3030505	32,117	184	6,256	17,546	23,986	1%	7,012	No data
CLW	3030506	28,422	22	3,479	9,847	13,348	0%	3,982	No data
CLW	3030602	22,327	2,725	8,795	5,258	16,778	16%	2,308	No data
CLW	3030701	28,130	155	3,944	12,783	16,882	1%	4,909	No data
BOTH	3030703	21,499	237	4,852	14,948	20,037	1%	5,774	No data
NEZ	3050101	28,477	2,224	9,039	11,610	22,873	10%	4,638	No data
NEZ	3050102	44,361	637	16,184	7,110	23,931	3%	6,542	No data
NEZ	3050301	48,616	1,657	7,096	12,598	21,351	8%	4,748	No data
NEZ	3050601	38,547	47	3,393	21,578	25,018	0%	7,458	No data
NEZ	3050602	48,238	231	8,886	18,413	27,530	1%	8,028	No data
CLW	3070101	23,481	0	6,169	12,540	18,709	0%	5,613	No data
CLW	3070102	17,920	0	3,039	14,128	17,167	0%	5,150	No data
CLW	3070103	26,837	0	8,127	17,220	25,347	0%	7,604	No data
CLW	3070104	34,398	757	10,710	17,963	29,430	3%	8,072	No data
CLW	3070201	49,683	1,327	8,624	26,562	36,513	4%	9,627	No data
CLW	3070202	36,917	480	7,487	19,666	27,633	2%	7,810	No data
CLW	3070204	30,027	0	5,527	15,281	20,808	0%	6,242	No data
CLW	3070402	56,787	1	5,674	31,025	36,700	0%	11,009	No data
CLW	3070501	29,834	15	2,542	15,440	17,997	0%	5,384	No data
CLW	3070502	31,141	0	2,337	19,364	21,701	0%	6,510	No data
CLW	3070503	31,599	93	7,701	9,795	17,589	1%	5,184	No data

Forest[1]	LAU	LAU Acres	CUS	DEN	GEN	Total Habitat	%CUS	Acres to 30%	Management Area
CLW	3070505	28,696	2,074	10,977	12,845	25,896	8%	5,695	No data
CLW	3070701	47,349	0	8,100	28,346	36,446	0%	10,934	No data

Table 73. Distribution of Management Areas within LAUs above or near 30% currently/temporarily unsuitable

LAU	CUS	LAU Acres	Acres MA1 (% LAU)	Acres MA 2 (% LAU) Primitive	Acres MA 2 (% LAU) Wildland Recreation	Acres MA 2 (% LAU) Backcountry Restoration	Acres MA 2 (% LAU) Research Natural Area	Acres MA 3 (% LAU)
3030202 (occupied)	31%	10,518	10,518 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
3030206 (occupied)	35%	10,811	7,450 (69%)	470 (4%)	1,425 (13%)	1,466 (14%)	0 (0%)	0 (0%)
2070902 (unoccupied)	29%	17,990	2,919 (16%)	0 (0%)	0 (0%)	5,615 (31%)	938 (5%)	8,518 (47%)
2070601 (unoccupied)	28%	23,088	3,082 (13%)	19,488 (84%)	0 (0%)	157 (<1%)	0 (0%)	361 (2%)
2070603 (unoccupied)	27%	36,655	33,963 (93%)	149 (<1%)	0 (0%)	2,139 (6%)	0 (0%)	404 (1%)

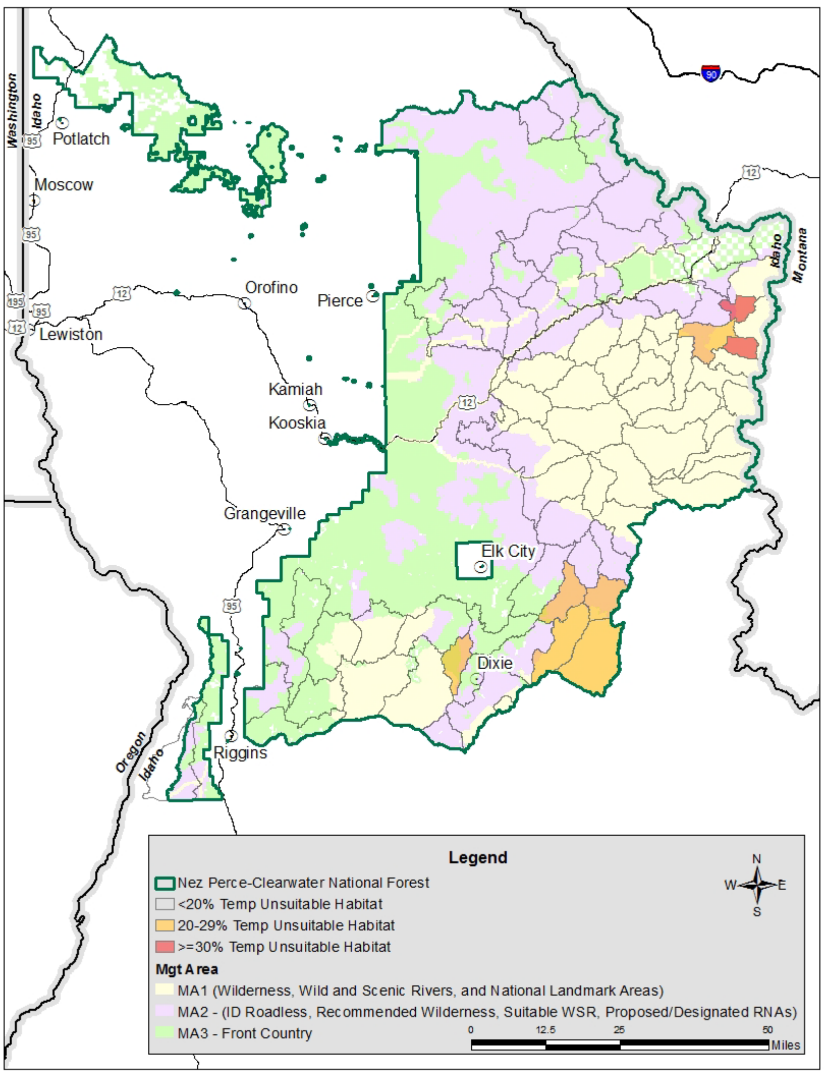


Figure 31. Distribution of LAUs with currently unsuitable habitat exceeding 20%

VEG S2

Additionally, Standard VEG S2 requires that timber management projects shall not regenerate (i.e., change to stand initiation structural stage) more than 15 percent of lynx habitat within a lynx analysis unit in a 10-year period. While some treatment may result in regenerating lynx habitat to stand initiation structural stages, these young stands typically contain high stem densities and horizontal cover, which provides summer habitat and eventually grows into essential winter foraging habitat for snowshoe hares. By limiting the rate of regeneration harvest in each lynx analysis unit, this standard would help to maintain a mosaic of habitat over time, as called for under VEG O2, which would benefit lynx by providing distribution of prey resources across the landscape.

The revised forest plan does include Plan Components which are indirectly associated with VEG S2. For example, FW-STDTBR-5 emphasizes that, where necessary to achieve desired conditions the maximum size of openings within regeneration harvest units (i.e., clearcut, seed tree cut, shelterwood cut, etc.) will be 207 acres. Additionally, FW-STD-TBR-08, FW-STD-TBR-09, and FW-STD-TBR-10 establishes the conditions under which various regeneration harvest prescriptions (clearcut, seedtree harvest, or shelterwood harvest) will be applied. Regeneration harvest can help maintain a mosaic of seral stages across the landscape.

Vegetation Standards VEG S1 and VEG S2 promote a balance, a mosaic, of young and older stands within each lynx analysis unit.

VEG S5

In summary, standard VEG S5 limits precommercial thinning projects during the stand initiation structural stage until the stand no longer provides winter snowshoe hare habitat, with certain exceptions or exemptions allowed under the 2007 incidental take statement. The intent is to maintain the habitat conditions that are expected to produce high densities of snowshoe hares, which would contribute to sustaining the lynx population.

There are no plan components in the revised forest plan which directly or indirectly relate to VEG S5. However, as noted below, the Forest is proposing to expand the acres of precommercial thinning which may be excepted from the standard. The expanded acres are expected to be necessary to meet desired conditions for Western white pine, whitebark pine, and aspen.

Proposed Exceptions to VEG S5

The Northern Rockies Lynx Management Direction identifies six exceptions to the standard VEG S5 that could be used to meet other resource objectives. These are: (1) within 200 feet of administrative sites, dwellings, or outbuildings; (2) for research studies or genetic tree tests; (3) based on new, peer-reviewed information demonstrating that a project is not likely to affect lynx or would have short-term adverse effects but long-term beneficial effects; (4) for conifer removal or daylight thinning where aspen is in decline; (5) for daylight thinning of planted rust-resistant western white pine where 80 percent of the winter snowshoe hare habitat is retained; or (6) to restore whitebark pine. Exceptions 2 through 6 may only be utilized in lynx analysis units where standard VEG S1 is met. Since 2007 the Nez Perce-Clearwater has used none of the allotted wildland urban interface exemptions to any of the standards for fuels treatments (see Wildfire, Fire Suppression, Fire Management, and Fuels Management section below).

Desired conditions for all management areas includes an increase in seral species composition, benefiting whitebark pine, western white pine, and aspen while decreasing in climax species composition. This is expected to be accomplished through a combination of silvicultural thinning treatments and the use of prescribed fire. As a result, an increase in exception acres for pre-commercial thinning, particularly for Western White Pine and Whitebark Pine will be necessary to accomplish desired conditions.

Western White Pine (Cool-moist Potential Vegetation Type Group)

Table 74. Current dominance of western white pine by Management Area within cool moist potential vegetation type

Dominance Type	Management Area	Current Condition	Desired Range	Expected Dominance In 20 years	Expected Dominance In 50 years
Western white pine	MA 1	0%	5-10%	1%	4%
Western white pine	MA 2	0%	5-10%	1%	7%
Western white pine	MA 3	0%	5-10%	0%	5%

The desired condition is to bring Western white pine from approximately 0 percent dominance across the Management Areas to 5-10 percent. However, this change in dominance would happen incrementally and is expected to be approximately one percent over the next 20 years. This would equate to an increase of approximately 8,589 acres of white pine in the different Management Areas.

Table 75. Anticipated acres of dominance change in western white pine the next 20 and 50 years by Management Area

Management Area	MA Total Acres	PVT	Proportion of MA	PVT Acres	Anticipated Dominance Change	Anticipated Acres Change in Next 20 Years	Acres of Lynx Habitat Within WP Dominance Type Changes
MA 1	1,231,638	Cool-Moist	34%	418,757	1%	4,188	2,100
MA 2	1,467,078	Cool-Moist	30%	440,123	1%	4,401	1,867
MA 3	1,240,340	Cool-Moist	13%	161,244	0%	0	0
Total	N/A	N/A	N/A	N/A	N/A	8,589	3,966

However, only a portion of that would overlap within lynx habitat. It could be expected that approximately 3,966 acres of lynx habitat could be affected by a change in dominance classes over the next 20 years as a result of management actions, given modeling projections.

Pre-commercial thinning would not be allowed in Management Area 1 and there is no anticipated change in dominance in Management Area 3. Using the total acres of western white pine dominance in lynx habitat within the remaining Management Area, Management Area 2 (1,867), represents approximately 0.1 percent of the lynx habitat across the Forest. The Forest is proposing to retain the existing exception of 1,930 acres for western white pine. Approximately 1,285 acres, or .2 percent, of the lynx habitat on the occupied portion of the Forest and approximately 645 acres (.1 percent) on the unoccupied portion of the Forest may potentially be affected (Table 78 and Table 83). This would be a maximum amount and actual acres treated are expected to be less given the limited use of past exceptions.

Whitebark Pine (Cold Potential and Cool-Moist Vegetation Type Groups)

Table 76. Current Dominance of whitebark pine types by Management Area within the cold and cool moist potential vegetation types

Dominance Type	Management Area	Current Condition[10]	Desired Range	Expected Dominance In 20 Years	Expected Dominance In 50 Years
Cold PVT Whitebark pine	MA 1	0%	35-50%	5%	8%
Cold PVT Whitebark pine	MA 2	2%	35-50%	2%	8%
Cold PVT Whitebark pine	MA 3	0%	35-50%	19%	35%
Cool Moist PVT Whitebark Pine	MA 1	0%	2-10%	1%	4%
Cool Moist PVT Whitebark Pine	MA 2	1%	2-10%	1%	4%
Cool Moist PVT Whitebark Pine	MA 3	0%	2-10%	0%	4%

Within the Cold potential vegetation type group, modest gains are achieved through reduction of subalpine fir/Engelmann spruce composition and trending toward desired conditions for lodgepole pine composition. The desired condition is to bring whitebark pine from current approximately 0-2 percent dominance across the Management Areas to 35-50 percent. However, this change in dominance will happen incrementally and is expected to be approximately 5-19 percent over 20 years depending on Management Area and 8-35 percent within 50 years again, depending on Management Area (Table 76).

The desired condition is to bring whitebark pine from approximately 0-1 percent in the Cool-moist PVT and 0-2 percent in the Cold PVT to 2-10 percent and 35-50 percent respectively. However, this change in dominance would happen incrementally and is expected to be approximately 1-19 percent over the next 20 years depending on PVT and Management Area. This would equate to an increase of approximately 29,626 acres of whitebark pine in the different Management areas and PVTs (Table 77).

[10] Current conditions are based on the proportion of the potential vegetation type group and management area that is classified as a "tree" lifeform.

Table 77. Anticipated acres of dominance change in whitebark pine the next 20 and 50 years by Management Area

Management Area	PVT	Proportion of MA	PVT Acres	Anticipated Dominance Change	Anticipated Acres Change in Next 20 Years	Acres of Lynx Habitat Within WBP Dominance Type Changes
MA 1	Cold	26%	320,226	5%	16,011	8,029
MA 1	Cool-Moist	34%	418,757	1%	4,188	2,100
MA 2	Cold	10%	146,708	0%	0	0
MA 2	Cool-Moist	30%	440,123	0%	0	0
MA 3	Cold	4%	49,614	19%	9,427	1,885
MA 3	Cool-Moist	13%	161,244	0%	0	0
Total	NA	NA	NA	NA	29,626	12,014

However, only a portion of that would overlap within lynx habitat. It could be expected that dominance classes within approximately 12,014 acres of lynx habitat would be dominated by whitebark pine in the next 20 years based on desired conditions outlined in the revised forest plan.

Pre-commercial thinning would not be allowed in Management Area 1 and there are zero acres of change in whitebark pine dominance anticipated in Management Area 2 over the next 20 years. Using the total acres of whitebark pine dominance in lynx habitat within the remaining Management Area, Management Area 3, (1,885 acres), represents approximately 0.1 percent of the lynx habitat across the Forest and .2 percent of the lynx habitat within the Management Area. Daylight thinning would be allowed around individual western white pine in a manner that retains most winter snowshoe hare habitat. Daylight thinning may reduce lynx habitat effectiveness, but since this tree species has declined by 95 percent across its range, it was decided that a limited amount of thinning should be allowed to maintain whitebark pine on the landscape. The Forest is proposing to increase the previous exception acres for whitebark pine restoration from 0 acres to 1,890 acres (.1% of the Forestwide lynx habitat). This would be evenly distributed (945 acres each) across the occupied and unoccupied portions of the Forest and represents a maximum of actual acres treated given the limited use of past exceptions.

Aspen (Cool Moist and Warm Moist Potential Vegetation Type Groups)

The Forest Inventory Analysis Summary Database indicates that less than one percent of the forested area is composed of the aspen cover type. Abundance and distribution of aspen on the Nez Perce-Clearwater is poorly understood and represented in literature. On the Forest aspen is most commonly associated with the cool moist and warm moist broad potential vegetation type groups. There are no known climax stands of aspen on the Nez Perce-Clearwater, indicating that aspen on this forest is primarily a seral component following disturbance.

Aspen is dependent on wildland fire as the disturbance regime required for regeneration. Fire suppression and associated forest succession has likely reduced aspen presence during the last half century (Keyser et al. 2005, Shinneman et al. 2013). As canopy density of conifers has increased and shifted from seral conifer components to climax conifer components the presence of aspen has declined.

The desired conditions for dominance types presented in the plan would improve conditions for successful regeneration of existing aspen clones following wildland fire. There is no defined metric for tracking the success of aspen recruitment following proposed management actions or natural disturbance.

As a proxy for improved forest conditions for aspen presence, the dominance types and size class objectives will likely improve conditions for aspen success and persistence.

The expected trend of some dominance types would move towards the desired condition, including increases in tree species presence and cover types associated with ponderosa pine; western white pine, western larch and decreases in tree species presence and cover types associated with grand fir. Conversely, other results indicate a trend away from the desired condition, including a static condition in the extent and dominance of western red cedar and increases in lodgepole pine. Several key species, including aspen and whitebark pine are projected to increase by 30 percent. The revised forest plan provides a Desired Condition for aspen.

> *"FW-DC-FOR-01: Aspen (Populus tremuloides) persists as vigorous, multi age stands over time across its range on NPCLW and aspen stands cover 1 percent of NPCLW."*

Reaching the desired condition of approximately 40,000 acres of aspen across the Forests (i.e., 1 percent), and the maintaining the persistence of aspen, is dependent upon management actions which attempt to mimic the natural range of variability for wildland fire, including thinning of conifer stands around identified aspen clones. Aspen thinning would have the highest potential to affect lynx/snowshoe hare habitat where activities occur in subalpine fir/Engelmann spruce/lodgepole pine dominated stands. Activities (conifer removal in aspen, daylight thinning around individual aspen trees) to restore aspen would affect approximately 1,000 acres Forestwide (500 acres on the occupied potion of the Forest and 500 acres on the unoccupied portion) and would affect limited lynx habitat. The Forest is developing an aspen stand layer for evaluating and ranking stands for treatment. Approximately 2,267 acres of aspen stands have been identified. While not complete it can provide a window into where aspen may overlap with lynx habitat. Approximately 673 acres (30 percent) of the aspen stands overlap with lynx habitat. If we assume that approximately 30 percent of the 40,000 acres of aspen from the desired condition overlaps with lynx habitat then that would provide an estimate of 12,000 acres of aspen/lynx habitat overlap. However, around half of the lynx habitat on the Forest is found within Designated Wilderness or areas of Primitive Roadless designation where natural disturbances (fire, insects & disease) are expected to play a majority role. An additional 32 percent overlaps with other Roadless Designations where access may be limited so a major proportion may also be dependent on natural disturbances. It is expected that approximately 1,000 acres treatment of aspen stands 500 (.07 percent) on the occupied portion of the Forest and 500 acres (.07 percent) on the unoccupied portion of the Forest), using the exceptions to VEG S5, would be a maximum amount and actual acres treated are expected to be much less given the limited use of past exceptions.

Pre-commercial thinning would not be feasible or needed in all these young stands, depending on the site specific existing and desired conditions, nor would current or anticipated budget levels support thinning all these acres.

Attainment of desired conditions for the primary seral species of whitebark pine, western white pine, western larch, and ponderosa pine will require a restoration strategy that focuses not only on retaining these species where they occur but increasing species composition through artificial regeneration. This process requires time to produce results with an expected 70 to 100 years to achieve desired conditions.

Table 78. Previous and proposed pre-commercial thinning exception acres within lynx habitat

Forest	Administrative Sites	Research	Genetic Testing	Aspen	White Pine	White-bark Pine	Total Acres (% of Lynx Habitat)
2007 Exceptions (U.S. Department of Agriculture 2007d). Appendix K. Clearwater (Occupied)	0	0	0	0	1,930 (0.3%)	0	1,930 (0.3%)
2007 Exceptions (U.S. Department of Agriculture 2007d), Appendix K. Nez Perce (Unoccupied)	120 (0.02%)	0	0	0	0	0	120 (.02%)
Forest Plan Revision Proposed Exceptions Clearwater (occupied)	0	0	0	500 (0.07%)	1,285 (0.2%)	945 (0.1%)	2,730 (0.4%)
Forest Plan Revision Proposed Exceptions Nez Perce (unoccupied)	120 (0.02%)	0	0	500 (0.07%)	645 (0.09%)	945 (0.1%)	2,210 (0.3%)
Forest Plan Revision Proposed Exceptions Forestwide	120 (0.01%)	0	0	1,000 (0.07%)	1,930 (0.1%)	1,890 (0.1%)	4,940 (0.3%)

Thinning to enhance whitebark pine, Western white pine and aspen would benefit other wildlife species and would occur on a limited number of acres of lynx habitat, resulting in a minor adverse effect on lynx. The exceptions to VEG S5 are anticipated to result in the loss of lynx foraging habitat in some treated stands, which could have an adverse effect on lynx survival and reproduction by reducing prey resources. However, the Forest now has substantial acres which have burned since 2000, creating an abundance of forests that are, or soon will be providing stand initiation hare habitat, so adverse effects of proposed pre-commercial thinning are expected to be minor.

As previously analyzed in the biological assessment for the Northern Rockies Lynx Management Direction it is anticipated that the overall acres for purposes of incidental take would be constrained but that there would be flexibility as to which exception categories are used in order to respond to changing budgets, conditions and needs. Additional consultation would occur at the project level to assess site-specific effects on Canada lynx and their habitat. The addition of 1,890 acres of exception from VEG S5 for the restoration of whitebark pine would bring the total acres of exceptions to 4,940 acres or approximately 0.3 percent of the lynx habitat across the occupied and unoccupied portions of the Forest. This is less than the total area analyzed and consulted on as potentially impacted by exemptions and exceptions (0.5 percent) in the in the Northern Rockies Lynx Management Direction (U.S. Department of Agriculture 2007d, U.S. Department of the Interior 2017e).

The Forest is not proposing further changes to VEG S5 beyond changes to wildland urban interface boundaries where exemptions may be applied toward six percent of the lynx habitat on the Forest (see Wildfire, Fire Suppression, Fire Management, and Fuels Management section below).

VEG S6

Standard VEG S6 precludes vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late successional forests. This standard protects mature, multi-story habitat that provides a dense understory and high-quality snowshoe hare habitat.

Multistory forest that provides snowshoe hare and lynx habitat was modeled over the next five decades. Since the model was not able to discern whether a dense understory is present or not, this should be interpreted as areas with a potential to provide winter snowshoe hare and lynx habitat. The model depicted a trend in forest stands that are most likely to have a multistoried structure, high canopy closure, and presence of subalpine fir and spruce. For potential multistory habitat, the range between maximum and minimum natural range of variation is very large, almost 650,000 acres. Since the model reduces harvest based upon lynx Standard VEG S6 and applies fire suppression logic as well as forest succession for all alternatives, levels of modeled multistoried lynx habitat slightly exceed the maximum range of natural range of variation for the first two decades. By the third decade, modeled levels of fire and/or insects and disease increase, consistent with projected changes in climate. If insects and disease kill scattered patches of trees in the overstory of multistoried forests, that could increase the density of the understory, creating multistoried stands after a lag time of a few decades, provided the loss of canopy cover is not too great. In contrast, stand-replacing wildfires would create more stand initiation habitat after a lag time of a few decades. Over the next five decades, the acres of modeled stand initiation habitat fluctuate up and down decade by decade.

Despite plan components to maintain or increase multistoried hare and lynx habitat, modeled declines below current levels are projected to occur by the end of five decades due to natural disturbances, which were modeled as increasing with a warmer, drier summer climate. Modeling of vegetation management that would occur under the preferred alternative, in combination with natural processes, shows that potential multistory hare and lynx habitat is expected to stay within the natural range of variation.

Multistoried lynx habitat is provided by forests with a high proportion of trees in the diameter classes of 7 to 11 inches and 11 plus inches (Squires et al. 2006, Squires et al. 2010) and a dense understory providing snowshoe hare habitat. Although snowshoe hares require a dense understory, the SIMPPLLE model is dependent on Region 1 VMap classes and did not allow the incorporation of understory density. Modeled multistoried habitat is limited to cover types that contain subalpine fir or Engelmann spruce, which may be mixed with other species, within subalpine fir-spruce habitat groups. Similarly, modeling results suggest that currently slightly less of the forest in lynx habitat is in a younger size class which provides early stand initiation stage snowshoe hare habitat than prior to widespread fire suppression. There are currently more stands in the 5 to 14.9-inch size class than historically present. Likewise, there are less stands within the 0 to 4.9-inch, 15 to 19.9-inch, and 20 plus inch size classes than there were under natural disturbance.

In summary, standard VEG S6 limits vegetation management projects that would reduce winter snowshoe hare habitat in multistory forests, with certain exceptions or exemptions allowed under the 2007 incidental take statement. Fuels treatments intended to protect communities at risk within the wildland urban interface that do not meet the vegetation standards may occur on no more than 6 percent cumulatively on each national forest. Since 2007 the Nez Perce-Clearwater has used none of the allotted exemptions to any of the standards for fuels treatments (see Wildfire, Fire Suppression, Fire Management, and Fuels Management section below).

There are no proposed changes to VEG S6. Implementation of VEG S6 is expected to benefit lynx long-term by retaining and developing important winter habitat. There are three exceptions to standard VEG S6: (1) to accommodate fuels reduction activities within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special-use permit improvements, including infrastructure within permitted ski area boundaries, to provide defensible space; (2) for research studies or genetic tree tests; and (3) for incidental removal during salvage harvest (e.g., removal due to location of skid trails). Exceptions 2 and 3 can only be used in lynx analysis units where lynx habitat is less than 30 percent currently unsuitable (VEG S1). The exceptions to treating multi-story habitat (VEG S6) were anticipated to result in the loss of lynx foraging habitat in some treated multistory stands, which could have an adverse effect on lynx survival and reproduction by reducing prey resources. However, it was expected that an insignificant number of acres would be affected under the exceptions. The Forest is proposing anticipated treatments using exceptions to VEGS6 for the life of the revised forest plan, which is anticipated to be 15 years, as outlined below.

Mature multi-storied hare habitat is fairly common, currently comprising not less than 30 percent of the potential lynx habitat area across the Nez Perce-Clearwater although the amount fluctuates over time as the condition is removed by disturbance and develops in other stands. Modelling suggests that the amount of multistory habitat may increase for the first few decades (to nearly 40 percent of the potential lynx habitat area forestwide) and then decrease again to about 30 percent of the potential lynx habitat area forestwide by decade 5. Therefore, standard VEG S6 is likely to be more limiting in the future than in the current condition. At the broad scale the promotion of mature multi-storied forest is an important piece of the desired vegetation mosaic. VEG S6 would not necessarily preclude a trend towards other terrestrial vegetation desired conditions, in large part because vegetation treatments are predicted to influence a relatively minor proportion of the landscape. Additionally, timber harvest would be allowed in areas that have the potential to improve winter snowshoe hare habitat but presently have poorly developed understories. Forest Plan standards and guidelines to retain old growth, snags and down wood would contribute to denning habitat for Canada lynx.

As a result of recent wildfires, there is a large pulse of lynx habitat in the early stand initiation stage on the Nez Perce-Clearwater National Forest, primarily in wilderness and roadless areas. It is likely that these stands will develop into good-quality winter snowshoe hare habitat within about 20 years; however, after another 20 years or so, this large cohort of forests that are dominated by shade intolerant species and not subalpine fir or spruce, is likely to move into the stem exclusion stage, producing little hare habitat for several decades.

Wildfire, Fire Suppression, Fire Management, and Fuels Management

Fire historically played a substantial role in creating forested landscape patterns on the Nez Perce-Clearwater. The Forest has experienced several large stand-replacing wildfires since 2000 (table 55). As a result, in the next 15 to 25 years, a substantial portion of burned forest is expected to develop sufficient height and density to provide dense horizontal cover of branches at the snow surface to provide snowshoe hare habitat. The plan promotes greater use of wildfire within Management Areas 1 and 2 while wildland fire will continue to be suppressed in Management Area 3 lands.

Objectives, standards, and guidelines carried forward from the 2007 Northern Rockies Lynx Management Direction are carried through to the revised Forest Plan through FW-STD-WL-01. Additional plan components which directly or indirectly address the effects of fire, fire management and fuels management on a Forest-specific basis are listed in the Appendix H. Crosswalk of Applicable Forest Plan Components related to Canada lynx and/or Canada lynx habitat. Wildland fire management direction in the Forest Plan allows for activities to occur to meet social, economic, and multiple-use objectives of the

Forest while the revised forest plan will include fire management direction while support Canada lynx by emphasizing actions that move the Forest towards desired conditions for lynx habitat.

The plan direction is to increase the amount of early seral conditions in the plan area. These activities would reduce the effects from uncharacteristic wildfires that might cause too much early seral forest in lynx habitat.

Fuels Treatments in Wildland Urban Interface

Since the development of the Northern Rockies Lynx Management Direction Idaho, Clearwater, and Latah counties have developed Community Wildfire Protection Plans (CWPPs) to define wildland urban interface (WUI) areas. Approximately 276,046 acres of lynx habitat on the Forest overlaps with portions of the CWPP WUI areas, this represents about 19 percent of the lynx habitat across the Forest, exceeding the 6 percent limit set forth in the Northern Rockies Lynx Management Direction. Adoption of CWPP WUI boundaries would allow the Forest greater flexibility when locating and implementing hazardous fuels projects across the Forest. However, the cumulative total of acres of exempted fuels treatments within the wildland urban interface that do not meet the vegetation standards would remain capped at 89,272 acres or six percent of the lynx habitat across the Forest (table 79). Given that the Forest has used none of the wildland urban interface exemption acres allotted to the Forest since 2007, instead developing and implementing projects so that they meet Northern Rockies Lynx Management Direction, it is expected that this number will not be exceeded throughout the life of the revised forest plan.

Table 79. Total acres and proportions of exception and exemption acres proposed

Acre Category	Occupied Lynx Habitat	Unoccupied Lynx Habitat	Total
Total Acres of lynx Habitat	743,275	744,596	1,487,871
Acres of Lynx Habitat in CWPP WUI	78,112	197,934	276,046
Maximum acres of snowshoe hare habitat Treated Using Exemptions for Fuels Treatment Projects in CWPP WUI	44,596 (6%)	44,676 (6%)	89,272 (6%)
Maximum acres of snowshoe hare habitat Treated Using Exceptions for Activities for Other Resource Benefits	2,410 (.3%)	2,530 (.3%)	4,940 (.3%)
Total Acres of Snowshoe Hare Habitat Treated Using Exemptions and/or Exceptions	47,006 (6.3%)	47,206 (6.3%)	94,212 (6.3%)

In its previous biological opinion on the Northern Rockies Lynx Management Direction (U.S. Department of the Interior 2007b), the U.S. Fish and Wildlife Service assumed that fuel treatments within the wildland urban interface would not be excessively concentrated in adjacent lynx analysis units because fuel treatment projects may not result in more than three adjacent lynx analysis units exceeding standard VEG S1 (i.e., 30 percent or greater currently unsuitable). These limitations would continue to limit the concentration of impacts to Canada lynx in the future.

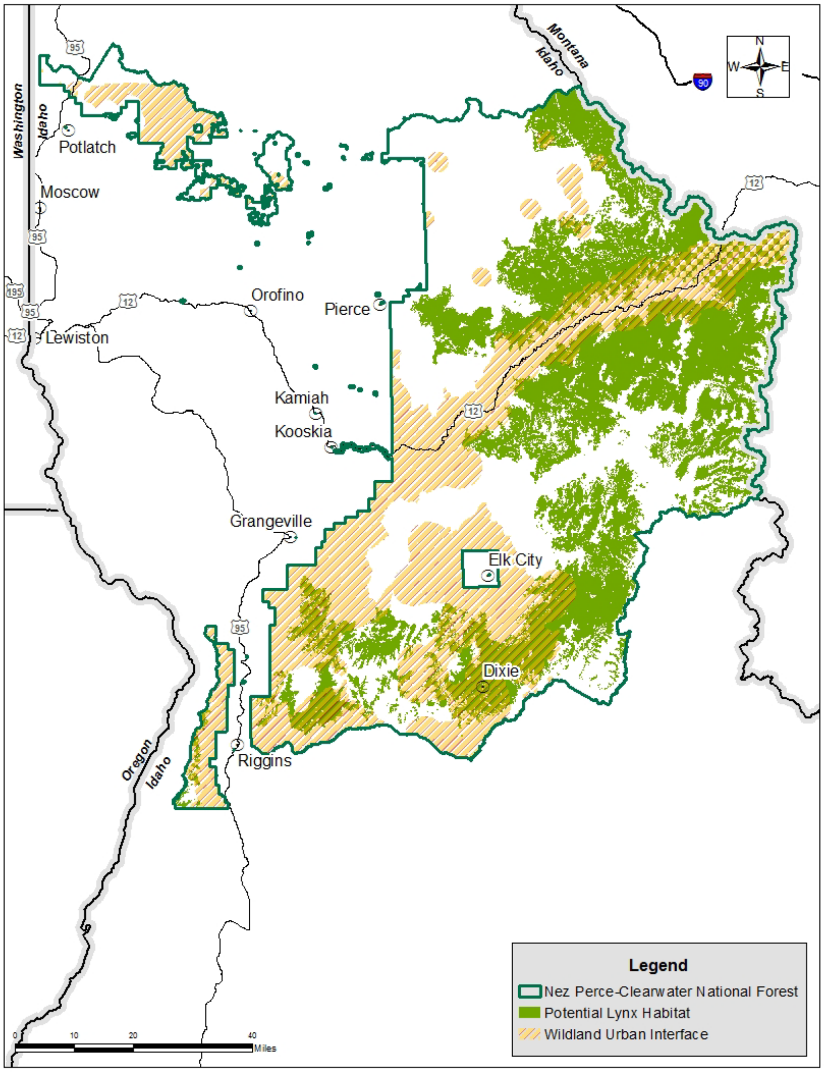


Figure 32. WUI areas proposed for fuels exemptions

To date the total amount of fuels treatments occurring in lynx habitat on the Nez Perce-Clearwater amounts to 17,257 acres, which is about 1.2 percent of the lynx habitat in the plan area. However, since 2007, the Nez Perce-Clearwater has used none of the exempted acres analyzed in the Incidental Take Statement. Instead, all fire and fuels projects have abided the Northern Rockies Lynx Management Direction standards and guidelines (i.e., no thinning or reduction of the understory in multi-story habitat was conducted in lynx habitat) and individual projects went through consultation. Fuels treatments in the wildland urban interface are anticipated to have adverse effects on lynx and their snowshoe hare prey because the intent would be to maintain lower tree density in these areas, resulting in less area of dense horizontal cover.

Reductions in snowshoe hare habitat due to fuels treatments, including commercial harvest and precommercial thinning, could lead to lowered reproduction and survival of lynx. However, adverse effects are limited in their extent and distribution. In its previous biological opinion on the Northern Rockies Lynx Management Direction (U.S. Department of the Interior 2017e), the U.S. Fish and Wildlife Service assumed that fuel treatments within the wildland urban interface would not be excessively concentrated in adjacent lynx analysis units because fuel treatment projects may not result in more than three adjacent lynx analysis units exceeding Standard VEG S1. Except to create defensible space, the exceptions may not be used in lynx analysis units that have more than 30 percent in stand initiation structural stage that does not yet provide winter snowshoe hare habitat. These limitations would continue to limit the concentration of impacts to Canada lynx in the future. As previously stated, a sound rationale for the need and efficacy of fuels treatments is needed when claiming the exemptions to the Northern Rockies Lynx Management Direction Vegetation Standards for fuels reduction projects implemented in the wildland urban interface.

The Standards, Objectives, and Guidelines laid out in the Northern Rockies Lynx Management Direction only apply to occupied lynx habitat. Since the Nez Perce portion of the Forest is currently considered unoccupied Northern Rockies Lynx Management Direction directs that projects need only consider applicable Standards, Objectives, and Guidelines. As with the ITS for the Northern Rockies Lynx Management Direction the ITS for the Forest Plan Revision Lynx Biological Assessment will not include exemption or exception acres assigned to the unoccupied portion of the Forest. Despite this the intent is to develop projects and analyze the effects of individual projects on this portion of the Forest as if it were occupied which is in line with Regional Forester direction. As a result, exemption acres will be applied to projects and tracked for reporting at such a time as the Forest is considered occupied.

Habitat Connectivity, Travel Corridors, and Linkage Areas

Human-caused alterations of natural landscape patterns can reduce the total area of habitat, increase the isolation of habitat patches, and affect movement between those patches of habitat (Interagency Lynx Biology Team 2013). Habitat fragmentation may be permanent, such as when converting forest habitat for residential developments or agricultural use, or temporary, such as when creating a forest opening through timber harvest until trees and shrubs regrow. Fragmentation of lynx habitat in the plan area due to anthropogenic developments is very low because the Nez Perce-Clearwater is a large contiguous block of area with much of it managed as wilderness or Idaho Roadless Rule areas.

Temporary fragmentation occurs because of departure of historic patterns of vegetation pattern. The amount of departure at a landscape scale is large, but the effect of this departure on fragmentation is probably slight. This could change if fires continue to burn hotter and larger than they did historically.

In addition to Northern Rockies Lynx Management Direction objectives, standards, and guidelines related to site-specific actions, the following objective, standard, and guidelines apply to all Forest projects within linkage areas in occupied habitat, subject to valid existing rights. Such management direction is incorporated to improve connectivity. Objective Link O1 directs the Forests to work with landowners in areas of intermingled land ownership to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat. Coordination among different land management agencies is important to lynx critical habitat because lynx have large home ranges and may move long distances. Thus, without coordination, the effects of mixed ownership patterns on lynx critical habitat would likely lead to reductions in habitat connectivity. Standard LINK S1 requires the Forests to identify potential highway crossings when highway or forest highway construction or reconstruction is proposed in linkage areas. In addition, Guideline LINK G1 guides Forests to retain Forest land in public ownership and Guideline LINK G2 guides management of livestock grazing in shrub steppe habitats to contribute to maintaining or achieving a preponderance of mid- to late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.

The objective, standards, and guidelines described above would reduce or minimize the potential for effects to lynx in most cases, and therefore the Northern Rockies Lynx Management Direction would ultimately conserve adequate connectivity with lynx critical habitat. The site-specific effects of projects proposed under the revised forest plan that may impact connectivity would be analyzed during project-specific consultation. Squires et al. (2013) concluded that while changes to habitat structure can affect lynx movement, there is no evidence that genetic isolation is an issue. We do not anticipate Forest actions carried out under the revised Forest Plan would create a barrier to, or impede, lynx movements resulting in adverse impacts to lynx connectivity. Thus, under the revised Forest Plan and Northern Rockies Lynx Management Direction, linkage and connectivity within lynx critical habitat would continue to serve their intended conservation role for lynx.

Additional plan components which directly or indirectly address habitat connectivity and travel corridors on a Forest-specific basis are listed in Appendix H. Crosswalk of Applicable Forest Plan Components related to Canada lynx and/or Canada lynx habitat.

In summary, under the action alternative there are multiple objectives, standards, and guidelines that apply in lynx habitat in lynx analysis units. Guideline ALL G1 says that methods that avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal land. Objective LINK O1 encourages working with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions in mixed ownership areas to reduce the potential of adverse impacts on lynx and lynx habitat. In linkage areas, potential highway crossings will be identified (LINK S1), and Forest Service lands should be retained in public ownership (LINK G1). Guideline HU G6 says that methods to avoid or reduce the effects on lynx in lynx habitat should be used when upgrading unpaved roads to maintenance levels 4 or 5 if the result would be increased traffic speeds and volumes or a foreseeable contribution to increases in human activity or development in lynx habitat. Guideline HU G7 states that new permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity. New permanent roads and trails should be situated away from forested stringers.

Recreation

Some kinds of recreational activities cause loss of lynx habitat, lynx behavioral responses to human disturbance, or snow compaction. A variety of behavioral responses may be expected from individual lynx and in different contexts (Interagency Lynx Biology Team 2013). Studies in Colorado of lynx and winter recreators showed that lynx do not avoid winter recreation until it gets more intensive (Olson et al. 2018) and suggests lynx are generally tolerant of human activities. Squires et al. (2019) studied lynx habitat use concurrently with snowmobile recreation. Results indicated that Canada lynx and winter recreationists partitioned environmental gradients in ways that reduced the potential for recreation-related disturbance. The environmental gradients that most separated areas selected by Canada lynx from those used by recreationists were forest canopy closure, road density, and slope. Canada lynx also avoided areas selected by motorized winter recreationists (snowmobiling off-trail, hybrid snowmobile) compared with either no functional response (hybrid ski) or selection for (backcountry skiing) areas suitable for nonmotorized winter recreation.

Recreation can occur across all lynx habitat and accessibility generally limits both the distribution and intensity of recreation and may vary seasonally. However, increased prevalence of motorized snow bikes (snow motorcycles) and ATVs/UTVs modified with tracks is allowing access to new terrain and shoulder seasons not available to traditional over-the-snow uses. The occupied portion of the Forest currently has a travel plan which does not allow motorized cross-country travel during the summer and restricts over-the-snow vehicle use in recommended wilderness areas. Additionally, mechanized recreation is disallowed in designated wilderness so recreation must be accessed on foot or horseback. The unoccupied portion of the Forest does not yet have an updated Travel Plan, summer and winter motorized cross-country travel is currently allowed. This leaves the scope of this threat overall as large but the severity slight for an overall threat impact of low using the Nature Serve methodology which was used for assessing threats to wildlife species. The alternatives vary in the amount of habitat that is open to motorized recreation.

The U.S. Fish and Wildlife Service's final rule listing the lynx determined there was no evidence that competition from coyotes, bobcats, or mountain lions, as facilitated by compacted snow trails, was negatively affecting lynx at a population-level scale (U.S. Department of the Interior 2000a).

Winter Recreation

The 2012 Planning Rule requires plans to develop components for multiple uses for sustainable recreation, including recreation settings, opportunities, and access. The forest plan revision will set the winter recreation opportunity spectrum for the both the Nez Perce and Clearwater National Forests. The winter recreation opportunity spectrum was developed following guidance from the Final Directives for the 2012 Planning Rule (FSH 1902.12_20, section 23.23a).

While the recreation opportunity spectrum will not make decisions about specific travel routes, the recreation opportunity spectrum will provide the framework under which recreational opportunities, such as winter motorized recreation activities, could be allowed during future travel or recreation planning. The recreation opportunity spectrum categorizes recreational settings into six distinct classes. Each setting provides the opportunities to engage in activities, such as motorized, non-motorized, developed, or dispersed, on land, water, and in the air. The winter recreation opportunity spectrum settings establish where activities, such as over the snow motor vehicle use and motorized recreation, are allowed, including urban, rural, roaded natural, and semi-primitive motorized. Under the 1987 Plans, the winter recreation opportunity spectrum allows winter motorized travel in all settings except wilderness and recommended wilderness. Motorized summer recreation is generally not allowed in the primitive and semi-primitive non-motorized settings. Most effects to lynx are expected because of winter recreation because of the low susceptibility of lynx to displacement. The exception may be where activities may disturb lynx at den sites. However, since denning habitat is already well distributed no adverse effects related to non-winter recreational use have been identified (U.S. Department of the Interior 2007b).

There are no recreation-based components proposed in the revised forest plan which would directly or indirectly affect lynx or lynx habitat. Changes in Winter Recreation Opportunity Spectrum will increase areas where lynx habitat and motorized winter recreation may overlap (table 80). Primitive and semi primitive non-motorized are the two categories of the recreation opportunity spectrum that do not allow motorized over-snow travel. Within Forest Plan Revision the amount of Forest-wide lynx habitat which falls under these two categories would be reduced from approximately 74 percent to 50 percent. Conversely, other recreation opportunity spectrum settings which are open to motorized over-snow travel would increase, effecting 50 percent of lynx habitat where previously it effected approximately 26 percent. As a result, more habitat could be made available for winter over the snow motorized uses under the revised forest plan. However, based on recent research, lynx do not avoid areas of winter recreation and where motorized over-the-snow activities overlap with lynx habitat, winter recreationalists and lynx partition use of the area which results in minor effects.

Table 80. Acres of lynx habitat and percent of total lynx habit by proposed recreation opportunity spectrum setting

Proposed Recreation Opportunity Spectrum Class	Summer Acres	Summer Percent of Potential Habitat	Winter Acres	Winter Percent of Potential Habitat
Primitive Occupied	196,849	27%	196,849	27%
Primitive Unoccupied	385,367	52%	385,727	52%
Primitive Forestwide Total	582,216	39%	582,216	39%
Semi-primitive non-motorized Occupied	241,329	32%	117,615	16%
Semi-primitive non-motorized Unoccupied	73,832	10%	44,965	6%
Semi-primitive non-motorized Forestwide Total	314,161	21%	162,580	11%
Semi-primitive motorized Occupied	223,803	31%	425,824	57%
Semi-primitive motorized Unoccupied	141,519	19%	279,516	38%
Semi-primitive motorized Forestwide Total	365,322	25%	705,304	47%
Roaded Natural Occupied	81,406	11%	3,313	<1%
Roaded Natural Unoccupied	142,187	19%	34,601	4%
Roaded Natural Forestwide Total	223,593	15%	37,734	3%
Rural Natural Occupied	221	<1%	0	0%
Rural Natural Unoccupied	2,368	<1%	0	0
Rural Natural Forestwide Total	2,579	<1%	0	0

Table 81. Acres of lynx habitat and percent of total lynx habit by current recreation opportunity spectrum setting

Current Recreation Opportunity Spectrum Class	Summer Acres	Summer Percent of Potential Habitat	Winter Acres	Winter Percent of Potential Habitat
Primitive Occupied	199,025	27%	212,993	29%
Primitive Unoccupied	303,875	41%	317,916	43%
Primitive Total	502,900	34%	530,909	36%
Semi-primitive non-motorized Occupied	330,435	44%	331,004	45%
Semi-primitive non-motorized Unoccupied	235,771	32%	233,167	31%
Semi-primitive non-motorized Forestwide Total	566,206	38%	564,171	38%
Semi-primitive motorized Occupied	143,796	19%	90,779	12%
Semi-primitive motorized Unoccupied	114,351	15%	84,606	11%
Semi-primitive motorized Forestwide Total	258,147	17%	175,385	12%
Roaded Natural Occupied	70,343	10%	108,825	15%
Roaded Natural Unoccupied	90,275	12%	108,581	15%
Roaded Natural Forestwide Total	160,618	11%	217,406	14%
Rural Natural Occupied	0	0%	0	0%
Rural Natural Unoccupied	0	0%	0	0%
Rural Natural Forestwide Total	0	0%	0	0%

The revised forest plan includes Northern Rockies Lynx Management Direction Objective HU O1 to maintain the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat. In addition, recreation activities should be managed to maintain lynx habitat and connectivity (Objective HU O2) and rather than developing new areas in lynx habitat, activities should be concentrated in existing developed areas (Objective HU O3). The Northern Rockies Lynx Management Direction Guideline HU G11 states that designated over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction, unless designation serves to consolidate use and improve lynx habitat. Further, Guideline HU G12 limits winter access for non-recreation special uses and mineral and energy exploration and development to designated routes or designated over-the-snow routes. These Northern Rockies Lynx Management Direction standards and guides limit the severity of effects from winter over-the-snow use.

Minerals

The Nez Perce-Clearwater has a long history of mineral exploration and development activity. Most of the mining has been oriented around rivers or in hard rock but few of them are open pit mines. Most mining activities on the Clearwater National Forest are outside of lynx habitat or are small scale explorations (test pits or drilling). There are no large-scale mines on the Nez Perce-Clearwater National Forests. Mining activities on the unoccupied portion of the Forest do extend up into lynx habitat around Elk City and southward along Crooked River. However, they have little effect on lynx habitat because of small area of effects and would not affect a transient lynx.

Northern Rockies Lynx Management Direction Objective HU O5 directs the Forest to manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat. The Northern Rockies Lynx Management Direction also contains the following three guidelines that would minimize the potential impacts of energy and mineral development on lynx by remote monitoring to reduce snow compaction (Guideline HU G4), reclamation plans that restore lynx habitat (Guideline HU G5), and limitations on winter access to designated routes or designated over-the snow routes (Guideline HU G12). With the application of these measures, the energy and mineral development under the revised forest plan would likely result in either no effects or only minor, insignificant effects to lynx habitat depending upon the scale of development. Lynx habitat would continue to serve its intended conservation role for lynx.

No oil and gas sites have been developed and no foreseeable oil and gas exploration is expected. The geology under the Nez Perce-Clearwater has low potential for oil and gas production.

Many acres of National Forest System lands on the Nez Perce-Clearwater are withdrawn from mineral entry. Designated wilderness, Idaho Roadless Rule areas, wild and scenic rivers, and research natural areas have withdrawn or restricted mineral exploration. These areas represent approximately 82 percent of the lynx habitat on the Forest. Withdrawal of large areas of the Nez Perce-Clearwater from mineral development reduces the risk of Canada lynx habitat loss, disturbance, displacement, and mortality. All withdrawals are subject to valid existing rights. The Forest Service does not have the discretion to deny the right to exercise an outstanding mineral right. However, the developer does not have unrestricted rights because the developer's rights are limited to using only as much of the surface as is reasonably necessary to explore, develop, and transport materials. The developer must provide an operating plan to the Nez Perce-Clearwater. The Nez Perce-Clearwater has some ability to manage surface resources.

The U.S. Fish and Wildlife Service found no evidence that mineral development was a factor threatening lynx, therefore, did not address mineral development in the final listing rule (March 24, 2000; 65 FR 16052). The proposed action retains Northern Rockies Lynx Management Direction Standards, Objectives, and Guides (FW-STD-WL-01) which contains the following guidelines designed to minimize the impacts of minerals related activities on individual lynx and lynx habitat:

No additional Forest Plan Components related to minerals and energy development have been developed specific to lynx. However, other direction to protect forest resources (including lynx and lynx habitat) from adverse impacts associated with access to exploration and extraction of mineral resources is derived from established laws, regulations, and policies. These are independent of forest plan direction. Examples include:

- Road construction or reconstruction associated with mining activities within Idaho Roadless Rule areas may only be approved after evaluating other access options and must be conducted in a manner that minimizes effects on surface resources as well as be consistent with land management plan components. Road constructed or reconstructed in Idaho Roadless Rule areas must be decommissioned upon completion of the project or expiration of the lease, permit, or other authorization.
- The Forest Service will not authorize the sale of common variety mineral materials in Idaho Roadless Areas designated as Wild Land Recreation, Special Areas of Historic or Tribal Significance, or other Primitive themes.
- The Forest Service will not recommend, authorize, or consent to road construction, road reconstruction, or surface occupancy associated with mineral leases in Idaho Roadless Areas designated as Wild Land Recreation, Special Areas of Historic or Tribal Significance, or Primitive themes.

- The Frank Church-River of No Return, Selway Bitterroot, and Gospel Hump Wilderness areas have been withdrawn from mineral entry and are not available for new leases or claims for locatable minerals, mineral materials, or leasable minerals. Designated wilderness acreage does vary with each alternative designated and either withdrawn from mineral entry or mitigated at the project level. Mining activities may still occur in designated wilderness areas as long as the proponent has demonstrated a valid existing right.

Locatable Minerals

The Forest Plan identifies 1,114,736 acres as roadless, 28,498 acres as Gospel Hump MA2 lands, and 1,240,340 acres identified for all other uses in Management Area 3. Combining these acres totals 2,383,574 acres available for locatable mineral entry. However, within roadless, 258,210 acres are identified as recommended wilderness and 1,319 acres are identified for a suitable wild and scenic river classification. If designated and subject to valid and existing rights, these acres could be withdrawn from mineral entry; the remaining 2,073,807 acres would be open to mineral entry. This would include approximately 457,124 acres (62 percent) of lynx habitat within in occupied portion of the Forest and 294,470 acres (40 percent) within the unoccupied portion of the Forest. However, lack of roads within the remaining areas of Idaho Roadless Rule areas substantially limits access into areas for exploration of locatable minerals. Where they do occur locatable minerals activities are generally small and medium scale operations involving test pits or drilling core samples and affect a small area. For example, individual drill sites are typically approximately 30 feet x 50 feet each disturbing approximately .03 acres. Test pits and trenches average around 25-30 feet long and 2-3 feet wide. Even where multiple test pits trenches are opened the total acreage disturbed by such activities is usually less than .1 acre and represents a minimal potential effect to lynx habitat. Generally, only one pit/trench is open at a time and trenches are backfilled with overburden, existing stockpiled duff, vegetative matter and woody debris will be applied, and the area seeded and mulched. Access to test sites is often along existing roads and trails however, at times, overgrown roads may need to be opened up or temporary roads may need to be constructed. Temporary roads are decommissioned upon completion of the project.

Mineral Materials

Management Area 1, including approximately 617,617 acres (41 percent) of forestwide lynx habitat, is not open for mineral materials. Mineral material development is possible in Management Area 2 if classified with a backcountry and restoration theme. However, mineral material development can only occur to support projects that are consistent with the land management plan and if use of the materials is incidental to an authorized activity. It is impossible to predict mineral material development and production necessary to support future authorized activities within a backcountry and restoration theme. For this reason, 1,240,340 acres within Management Area 3 is open for discretionary disposal of mineral materials.

Leasable Minerals

Management Areas 1 and 2 will not open for leasable mineral entry under the Forest plan. Approximately 1,239,816 acres (83 percent) of forestwide lynx habitat fall within these two management areas and would be affected by leasable material developments. The remaining 248,055 acres (17 percent) of lynx habitat could potentially be affected by leasable mineral developments within Management Area 3. However, as previously mentioned, interest in leasable mineral resources on the Nez Perce-Clearwater is low because of past unsuccessful attempts to locate and develop these resources. No exploration or development of other nonrenewable energy sources is expected during the 15 years.

No additional Forest Plan Components related to minerals and energy development have been developed specific to lynx. However, Northern Rockies Lynx Management Direction Standards, Objectives and

Guidelines listed above will continue to limit the potential local impacts of roads on lynx and lynx habitat Forestwide.

National Forest System and Backcountry Roads

As previously stated in the Forest/Backcountry roads provide human access into lynx habitat where mortality may occur because of lynx being hit by motorized vehicles, mortality, or injury due to incidentally in traps aimed for other species, or through illegal shooting. However, the Forest is unaware of any incidents of lynx mortalities or injury on the Forest as a result of motorized access.

On the Nez Perce-Clearwater, most roads occur within the lands managed as general management in Management Area 3 and outside of lynx habitat, as most of the lynx habitat is within Idaho Roadless Rule areas and wilderness where new road construction is prohibited. About 18 percent of lynx habitat occurs within Management Area 3 so most of the effects of back country roads is limited to this area, though some existing roads do separate or are cherry stemmed into Management Areas 1 and 2. Within Roadless Rule areas, roads travel between roadless areas but are already established. The Forest Plan will not make any specific decisions on roads but establishes the setting governing future proposed roads.

Two standards and four Northern Rockies Lynx Management Direction guidelines (as well as two objectives) concern National Forest System roads. To reduce highway effects on lynx, Objective HU O6 directs the Forests to work cooperatively with other agencies to provide for lynx movement and habitat connectivity and to reduce the potential of lynx mortality. While this objective relates to highways, which typically do not occur on Forest land, it encourages cooperation with other agencies in order to reduce the potential for effects. Several guidelines relate to potential impacts of Forest roads, including upgrading (Guideline HU G6), new permanent roads (Guideline HU G7), cutting brush (Guideline HU G8), and new roads built for project use (Guideline HU G9). These guidelines generally discourage improving road access for people and minimize impacts of road construction (permanent and/or temporary) and maintenance on lynx critical habitat.

Road construction results in a small reduction of lynx habitat by removing forest cover. On the other hand, if a road is closed, regrowth of dense vegetation may provide good snowshoe hare habitat, and lynx and other predators may use the roadbed for travel and foraging (Koehler and Brittell 1990). Extensive backtracking studies in Montana found that lynx did not avoid gravel forest roads (Squires et al. 2010). Trails are typically narrow routes with a native surface; there is no information to suggest that trails have negative impacts on lynx (Interagency Lynx Biology Team 2013). Road densities within lynx habitat on the Nez Perce-Clearwater are low because most lynx habitat occurs within roadless and wilderness. Thus, the overall impact is low because of its small scope in lynx habitat and low severity in effects.

Livestock Grazing

Livestock management includes grazing of livestock on Forest lands. Livestock may compete with snowshoe hares for forage resources (Ruediger et al. 2000b). Browsing or grazing also could impact plant communities that connect patches of lynx habitat within a home range. Snowshoe hare habitat such as riparian willow and aspen communities are most likely to be affected by grazing (Interagency Lynx Biology Team 2013). Conversely, appropriate grazing management can rejuvenate and increase forage and browse in some habitats. At the time of the lynx listing, the Service found no evidence that grazing was a factor threatening lynx, therefore, grazing was not addressed in the final lynx listing rule (March 24, 2000; 65 FR 16052). Overall, grazing is not likely to reduce the snowshoe hare prey base or have substantial effects on lynx (Interagency Lynx Biology Team 2013). As such, there is no existing research that provides evidence of lynx critical habitat being adversely affected by grazing or of lynx movements within home ranges being impeded by grazing practices.

The Northern Rockies Lynx Management Direction identifies one objective and four guidelines related to livestock management. Objective GRAZ O1 directs the Forest to manage livestock grazing to be compatible with improving or maintaining lynx habitat. The Northern Rockies Lynx Management Direction would reduce the potential for grazing to affect lynx critical habitat through the guidelines for livestock management practices that provide for: regeneration of trees and shrubs (Guideline GRAZ G1), aspen stands (Guideline GRAZ G2), riparian areas and willow cars (Guideline GRAZ G3), and shrub-steppe habitats (Guideline GRAZ G4). These guidelines should adequately minimize the potential for effects of grazing to lynx critical habitat and may improve the habitat over baseline conditions.

No additional plan components from the revised forest plan related to grazing management have been developed specific to lynx. However, Northern Rockies Lynx Management Direction Standards, Objectives and Guidelines listed above will continue to limit the potential local impacts of livestock grazing on lynx and lynx habitat Forestwide.

Climate Change

This section considers the effects of climate change on the Revised Forest Plan as it relates to lynx habitat management. The effects of climate change on lynx habitat have been considered in the modeling of the effects of future management direction proposed under the revised Forest Plan. Multi-story habitat is likely to reduce, mainly as a result of climate changes. However, due to plan components to maintain or increase, multistory is likely to remain within the Natural Range of Variability.

While the Lynx Conservation Assessment and Strategy did not provide management recommendations specific to changing climate, possible effects on lynx as a result of future changes in climate have been hypothesized as:

- Potential upward shifts in elevation or latitudinal distribution of lynx and their prey.
- Changes in the periodicity of when snowshoe hares change color or loss of snowshoe hare cycles in the north.
- Reductions in the amount of lynx habitat and associated lynx population size due to changes in precipitation, particularly snow suitability and persistence, and changes in the frequency and pattern of disturbance events, such as fire and insect outbreaks.
- Changes in the demography of lynx, such as survival and reproduction rates.
- Changes in predator-prey relationships.

There is a high level of uncertainty about some of these hypothesized effects. These effects are not expected to be realized fully within the next 15 years. Climate change is pervasive in extent in the plan area and may interact with wildfire and wildfire suppression to shift the distribution and amount of lynx habitat over time. The natural range of variation was modeled going back about 1,000 years and the effects were projected for the next 50 years, including anticipated changes in climate and the fire suppression logic of the model. Several future scenarios were modeled for comparison purposes, including a warmer and drier climate over the next five decades that would result in more acres burned due to expected climate change and continuing the current level of fire suppression into the future. Effects were modeled using SIMPPLLE and PRISM models. The SIMPPLLE and PRISM models provide a probabilistic assessment of the subset of federal actions that provide a programmatic framework for vegetation management activities across the Nez Perce-Clearwater over a 50-year future time period. However, since the exact location, extent, and timing of future fires, timber harvest, thinning, and planting are unknown, future site-specific actions would be subject to the requirements of Section 7 of the Endangered Species Act at a future time.

Despite plan components to maintain or increase multistoried hare and lynx habitat, modeled declines below current levels are projected to occur by the end of five decades due to natural disturbances, which were modeled as increasing with a warmer, drier summer climate. Modeling of vegetation management that would occur under the preferred alternative, in combination with natural processes, shows that potential multistory hare and lynx habitat is expected to stay within the natural range of variation.

Climate change is influencing 100 percent of all lynx habitat in the plan area; thus, the scope is pervasive. Using the moderate severity category estimates, the overall impact from climate change is estimated to be a medium threat by the combination of the pervasive scope and moderate severity. Over longer timeframes, the effects could be much more severe.

Other Forest Plan Components Related to Lynx

The proposed action has additional plan components that are tied to potential vegetation types within the context of the natural range of variation that directly and indirectly integrate Canada lynx habitat with desired conditions (Appendix H. Crosswalk of Applicable Forest Plan Components related to Canada lynx and/or Canada lynx habitat). For example, the revised plan contains a desired condition for habitat that contributes to species recovery needs, population trends that are stable to increasing across the species' range, and for critical habitats designated by the U.S. Fish and Wildlife Service to provide the physical and biological features identified as essential to the conservation of the species (FW-DC-WL 01).

Studies suggest that landscapes with a variety of size classes, structural stages, and proportions of forest structures can affect lynx selection and reproduction and snowshoe hare abundance. Management proposed at landscape scales under the forest plan would create similar conditions in some stands that would contribute to lynx selection and snowshoe hare abundance (Berg et al. 2012, Holbrook et al. 2017a, Holbrook et al. 2017b, Kosterman et al. 2018).

Desired conditions FW-DC-FOR-10 and MA1 and MA2-DC-FOR-04 address within-stand conditions in the cool, moist broad potential vegetation type and contain specific language to promote spruce and fir dominated stands to achieve a multistoried condition, which was written specifically to address lynx habitat needs. These desired conditions would allow maintenance of multistoried stand conditions within spruce and fir dominated stands in the cool, moist group.

Determination

Table 82. Lynx component and determination

Component	Determination
Canada Lynx	May Effect and is Likely to Adversely Affect
Canada Lynx Critical Habitat	No Effect

The reasoning for these determinations are as follows:

- The Plan retains Northern Rockies Lynx Management Direction standards, objectives, and guidelines through Plan Component FW-STD-WL-01 "Canada lynx habitat shall be managed in accordance with Northern Rockies Lynx Management Direction (2007d) and ROD, and any amendments, updates, or new direction forthcoming."
- The 2007 Biological Opinion for the Northern Rockies Lynx Management Direction determined that amendments to the Northern Rockies Lynx Management Direction would allow some adverse effects to lynx primarily from the following: 1) fuels management projects that are exempted from

vegetative management standards inside wildland urban interface (WUI) in up to six percent of occupied lynx habitat; and 2) exceptions to vegetative standards for some pre-commercial thinning projects that are conducted for fuels treatment or other resource benefits (e.g., whitebark pine restoration) (U.S. Department of the Interior 2007b).

- The exceptions to VEG S5 include the addition of approximately 1,885 acres for the restoration if whitebark pine. This would bring the total excepted acres across the Forest to 3,935 acres, or approximately 0.3 percent of the lynx habitat on the Forest. This is less than the total area analyzed and consulted on as potentially impacted by exemptions and exceptions (0.5 percent) in the in the Northern Rockies Lynx Management Direction (U.S. Department of Agriculture 2007a, U.S. Department of the Interior 2007b).

Table 83. Revised forest plan proposed exemptions

Forest	Admin. Sites	Research	Genetic Testing	Aspen	White Pine	White-bark Pine	Total Acres (% of Lynx Habitat)
Clearwater (Occupied)	0	0	0	500 (0.07%)	1,285 (0.2%)	945 (0.1%)	2,730 (0.4%)
Nez Perce (Unoccupied)	120 (0.02%)	0	0	500 (0.07%)	645 (0.09%)	945 (0.1%)	2,210 (0.3%)
Forestwide	120 (0.01%)	0	0	1,000 (0.07%)	1,930 (0.1%)	1,890 (0.1%)	4,940 (0.3%)

- Adoption of CWPP WUI boundaries would allow the Forest greater flexibility when locating and implementing hazardous fuels projects across the Forest. However, the cumulative total of fuel treatment projects within the wildland urban interface that do not meet the vegetation standards shall not exceed six percent of mapped lynx habitat per Forest. Acres of exempted fuels treatments would remain capped at 89,272 acres or 6 percent of the lynx habitat across the Forest. Given that the Forest has used none of the wildland urban interface exemption acres allotted to the Forest since 2007, instead developing and implementing projects so that they meet Northern Rockies Lynx Management Direction, it is expected that this number will not be exceeded throughout the life of the Plan.

Table 84. Occupied and occupied lynx habitat

Lynx Acres	Occupied Lynx Habitat	Unoccupied Lynx Habitat	Total
Total Acres of lynx Habitat	743,275	744,596	1,487,871
Acres of Lynx Habitat in CWPP WUI	78,112	197,934	276,046
Maximum acres of snowshoe hare habitat Treated Using Exemptions for Fuels Treatment Projects in CWPP WUI	44,596 (6%)	44,676 (6%)	89,272 (6%)
Maximum acres of snowshoe hare habitat Treated Using Exceptions for Activities for Other Resource Benefits	2,410 (.3%)	2,530 (.3%)	4,940 (.3%)
Total Acres of Snowshoe Hare Habitat Treated Using Exemptions and/or Exceptions	47,006 (6.3%)	47,206 (6.3%)	94,212 (6.3%)

- Other than fuel treatments in the wildland urban interface or for exceptions, the proposed action would continue to preclude pre-commercial thinning and understory removal in the majority of lynx habitat within the action area and thereby reduce the potential for degradation of existing snowshoe hare habitat.

- New proposed lynx analysis unit boundaries were developed to better match up with re-mapped lynx habitat. The new boundaries result in a change in the proportion of Currently Unsuitable Habitat within each lynx analysis unit.
- There has not been, any areas of Lynx Critical Habitat designated within the boundaries of the Nez Perce-Clearwater National Forests.

Monitoring

The proposed action includes monitoring requirements from the Northern Rockies Lynx Management Direction. Monitoring is required to report, and track, actions conducted under exceptions by Forest.

When project decisions are signed report the following:

Fuel Treatments:

> Acres of fuel treatment in lynx habitat by forest and lynx analysis unit, and whether the treatment is within *or outside* the wildland urban interface as defined by HFRA.
>
> Whether or not the fuel treatment met the vegetation standards or guidelines. If standard(s) are not met, report which standard(s) are not met, why they were not met, and how many acres were affected.
>
> Whether or not 2 adjacent lynx analysis units exceed standard VEG S1 (30 percent in a stand initiation structural stage that is too short to provide winter snowshoe hare habitat), and what event(s) or action(s) caused the standard to be exceeded.

Application of exception in Standard VEG S5

> For areas where any of the exemptions 1 through 6 listed in Standard VEG S5 were applied: Report the type of activity, the number of acres, and the location (by unit, and lynx analysis unit) and whether or not Standard VEG S1 was within the allowance.

Application of exceptions in Standard VEG S6

> For areas where any of the exemptions 1 through 3 listed in Standard VEG S6 were applied: Report the type of activity, the number of acres, and the location (by unit, and lynx analysis unit) and whether or not Standard VEG S1 was within the allowance.

Application of guidelines

> Document the rationale for deviations to guidelines. Summarize what guideline(s) was not followed and why.

Further, site specific consultation (second tier) is required for actions that may affect listed species, including those conducted under the exceptions and exemptions. Therefore, the monitoring and reporting required in the proposed action, along with routine project specific consultation, provides the Service a means to assess the validity of our assumptions (U.S. Department of the Interior 2007b).

Additional plan components which directly or indirectly address the effects of fire, fire management and fuels management on a Forest-specific basis are listed in Appendix H. Crosswalk of Applicable Forest Plan Components related to Canada lynx and/or Canada lynx habitat.

Grizzly Bear

Introduction, Scope of Consultation and Assumptions

Endangered Species Act consultation is typically conducted where a federally listed species is known to occur or may be present. The consultation for grizzly bears is unusual in that the Forest Service is consulting on grizzly bears for the whole plan area rather than only where grizzly bears may be present. There are a couple reasons for this. First is that the duration of the forest plan will be over a long period of time, the life of a forest plan is approximately 15 years but could be in place for much longer. For example, the existing forest plans have been in place since 1987, approximately 35 years. Second, the planning area contains a substantial portion of the Bitterroot Recovery Zone which is important to grizzly bear recovery. Thus, it's important to ensure that the plan maintains the ecological conditions within the Bitterroot recovery zone to contribute to recovery. Third, because of its location, much of the Nez Perce-Clearwater National Forest outside of the Bitterroot Recovery Zone is important for grizzly bear dispersal and connectivity from other grizzly bear ecosystems. Dispersal is important to re-populate the Bitterroot Recovery Zone, while connectivity is important to maintain genetic and demographic health of the bears within the recovery zone once they become established. Fourth, grizzly bears are wide ranging species and much of the plan area is within the dispersal capabilities of as many as three grizzly bear ecosystems. Therefore, this analysis evaluates and consults on the effects of the revised forest plan on grizzly bears across the whole planning area.

The analysis focuses on the effects of the plan on maintaining the ecological conditions within the Bitterroot Recovery Zone to contribute to recovery, as well as the effects of the plan on the ecological conditions to provide for connectivity and even support grizzly bears that may live outside the recovery zone in the future. Because there are no current grizzly bear populations in this area, there is little scientific information from this area from which to draw inferences. Therefore, the analysis draws from scientific information produced from the other grizzly bear ecosystems in the lower 48 states with the recognition that many aspects of grizzly bear ecology in this area are currently unknow. To compensate, the analysis assumes that grizzly bear behavior, demographics, ecology, and the effects to grizzly bears and their habitat would be similar here as they are in other grizzly bear ecosystems. The analysis is primarily focused on how the plan would affect the ecological conditions or habitat to support future grizzly bear populations both inside and outside of the Bitterroot Recovery Zone, and how the plan supports ecological conditions to allow connectivity of grizzly bears to become established through migration, dispersal or gradual expansion. With this emphasis, this analysis also evaluates effects to transient individuals that may be present.

Status and distribution

The historical range of the grizzly bear in the continental United States extended from the central Great Plains, west to California, and south to Texas and Mexico. Between 1800 and 1975, grizzly bear populations in the lower 48 states declined from over 50,000 to less than 1,000. As European settlement expanded westward, the grizzly bear was extirpated from most of its historical range (U.S. Department of the Interior 1993).

Four areas in Montana, Wyoming, and Idaho currently support grizzly bear populations. These areas are the Greater Yellowstone Ecosystem (GYE), Northern Continental Divide Ecosystem (NCDE), Cabinet-Yaak Ecosystem (CYE), and Selkirk Ecosystem (SE). According to the 2020 Grizzly Bear Recovery Program Annual Report, it is highly unlikely that the Northern Cascade Ecosystem (NCE) contains a grizzly bear population and there has been no confirmed evidence of grizzly bears within the US portion of the NCE since 1996 (U.S. Department of the Interior 2022). The sixth area, the Bitterroot Ecosystem was identified as having potential for providing for another population of grizzly bears. When the revised Grizzly Bear Recovery Plan was finalized, the Bitterroot Ecosystem had been loosely defined and there were questions as to whether it had a population of grizzly bears.

The grizzly bear recovery plan (U.S. Department of the Interior 1993) identified recovery zones that encompass the above five areas as well as the Bitterroot Ecosystem and the San Juan Ecosystem. The Bitterroot Ecosystem Recovery Plan Chapter was not published until 1996. The recovery zones, referred to as ecosystems in the recovery plan, were delineated to contain a large proportion of federal lands, including wilderness and national park lands that are protected from the influence of many types of human uses and activities occurring on lands elsewhere. Recovery zones are defined as areas that are necessary for the recovery of the species and are to be managed with an emphasis on conserving grizzly bear habitat. The Bitterroot Ecosystem was never delineated explicitly though the Bitterroot Chapter of Recovery Plan contains a map of the Bitterroot Ecosystem which included most of the Nez Perce-Clearwater National Forests (See figure 33 and figure 34).

The Recovery Zones represent a small fraction (less than two percent) of the grizzly bear's historical range (U.S. Department of the Interior 1993). While the range of bears in some ecosystems has significantly expanded since 1975, the overall range and distribution of bears in the lower-48 States remain below historical levels at approximately 6 percent of historical range (U.S. Department of the Interior 2022).

The U.S. Fish and Wildlife Service suggested in the Grizzly Bear Recovery Plan Bitterroot Chapter that recovery would require reintroduction of bears from other areas and offered alternatives to consider for recovery. In response, the U.S. Fish and Wildlife Service completed the required analysis under the National Environmental Policy Act and decision to establish a final rule to reintroduce grizzly bears in 2000 (50 C.F.R 17.84 (I)), Final Rule 65 Federal Register 69,624 Nov. 17, 2000). In 2000, the Service issued a 10(j) rule establishing the Bitterroot Grizzly Bear Experimental Population Area, an area in which the U.S. Fish and Wildlife Service considered the population of grizzly bears would be a non-essential experimental population after reintroduction (50 CFR 17.84 (I) 10-1-01 edition, Final Rule 65 Federal Register 69,624 Nov. 17, 2000). It also established that grizzly bears would be reintroduced under section 4 and 10(j) of the Endangered Species Act 50 C.F.R 17, 65 Federal Register 69,623 Nov. 17, 2000. The decision and associated final rule established the Bitterroot Grizzly Bear Experimental Population Area, and delineated the "Bitterroot Grizzly Bear Recovery Area," an area of recovery emphasis within the Experimental Population Area (50 CFR 17.84 (I) 10-1-01 edition, Final Rule 65 Federal Register 69,624 Nov. 17, 2000). The Bitterroot Recovery Area consists of the entirety of the Selway-Bitterroot and Frank Church-River of No Return Wilderness Areas plus limited areas outside of wilderness like the Magruder road (See figure 35 of the wilderness areas, and figure 34 of the Bitterroot recovery area and wilderness within the plan area below) (50 CFR 17.84 (I) Final Rule 65 Federal Register 69,624 Nov. 17, 2000, Codified at 50 C.F.R § 17.84(l)). Areas of the Nez Perce-Clearwater National Forest outside these Designated Wilderness Areas are not included in the Bitterroot Recovery Area as delineated except for some very limited areas near the Magruder road and near Burnt Knob, which were not included as wilderness within the Central Idaho Wilderness Act.

Of importance to note is that the U.S. Fish and Wildlife Service refers to the Bitterroot Recovery Area as the "Bitterroot Recovery Zone" in many of their publications such as the Species Status Assessment for the Grizzly Bear (U.S. Department of the Interior 2021c). Therefore, this document refers to the Bitterroot Recovery Area delineated in 50 C.F.R 17.84 (I) as the Bitterroot Recovery Zone which is shown in figure 34. The greater area identified in the Recovery Plan will be referred to in this document as the Bitterroot Ecosystem.

In 2001, in response from the States, and considering other recovery needs, the U.S. Fish and Wildlife Service issued a proposed rule to remove the 10(j) rule from the Code of Federal Regulations. In that notice, the U.S. Fish and Wildlife Service proposed to select the no action alternative, although this rule was never finalized. Therefore, the direction currently found in 50 C.F.R. § 17.84(l) for the Selway-Bitterroot ecosystem is still technically in effect. The federal register stated that if grizzly bears naturally dispersed to the BE, they would be protected as a threatened species under the Endangered Species Act. The U. S. Fish and Wildlife Service has not designated critical habitat within the Nez Perce-Clearwater National Forest.

The U.S. Fish and Wildlife Service reaffirmed in a letter dated January 21, 2020, that:

> *"…the current Endangered Species Act (ESA) section 10(j) rule for grizzly bears in the Bitterroot Grizzly Bear Experimental Population Area (BGBEPA), 50 CFR § 17.84(1), does not apply to grizzly bears that have dispersed into the BGBEPA on their own…[and]…grizzly bears that are present in the BGBEPA are not covered by the 10(j) rule and are considered threatened under the ESA. This means that ESA section 7 consultation obligations apply to proposed federal agency actions that may affect grizzly bear in the BGBEPA (U.S. Department of the Interior 2020c)."*

The Alliance for the Wild Rockies challenged the U.S. Fish and Wildlife Service in District Court for failing to finalize the 2001 Proposed Rule, failing to comply with the 2000 Record of Decision and Final rule, and violating NEPA and the Administrative Procedures Act by failing to prepare a supplemental EIS. The matter was remanded back to the U. S. Fish and Wildlife Service with direction to prepare a supplemental EIS and if warranted, a new Record of Decision and final rule. The U. S. Fish and Wildlife Service proposed and was granted permission by the court to initiate a new NEPA process, including a draft and final EIS and a new Record of Decision rather than supplementing the 2000 Environmental Impact Statement. A key requirement for 10(j) non-essential experimental status is that no members of the species exist in the area where the experimental population is to be established. The U.S. Fish and Wildlife Service cited changes in circumstances arising from individual bears dispersing within the Bitterroot Ecosystem with greater regularity as rational for a new EIS.

The 2000 environmental impact statement (U.S. Department of the Interior 2000b;c). explored a variety of alternatives to meet recovery objectives. The alternatives included whether grizzly bears would be translocated either as 10(j) or as Threatened species, or established through natural dispersal, with the full protection of the Endangered Species act. Alternatives also varied who would have management responsibility, with either a citizen committee or the U.S. Fish and Wildlife Service as alternatives. Also, the alternatives varied where the boundaries of the Bitterroot Recovery Area would be depending on whether grizzly bears were translocated or were established through natural dispersal. The different alternative boundaries included different amounts of lands administered by the Nez Perce-Clearwater National Forests. With the preparation of a new Environmental Impact Statement, the U.S. Fish and Wildlife Service anticipates considering a range of alternatives, including options to facilitate natural recolonization through affirmative actions, such as identifying connectivity areas, addressing sanitation issues, future augmentation, and/or revising the recovery plan chapter for the Bitterroot Ecosystem.

The presence of grizzly bears in the Bitterroot Ecosystem is currently through natural dispersal because no grizzly bears have been translocated to date. The plan area is outside other grizzly bear recovery zones and encompasses areas where grizzly bears could come from mainly the North and East into the Bitterroot Recovery Zone, though less likely, they could also come from the Yellowstone Ecosystem. The Bitterroot Recovery Zone has been identified as one possible path for genetic interchange from the Selkirk, Cabinet Yaak, and Northern Continental Divide Ecosystem (NCDE) into the Greater Yellowstone Ecosystem. Therefore, the Nez Perce-Clearwater has the distinctive role and contribution of providing ecological conditions for grizzly bears to recolonize the Bitterroot Recovery Zone and maintain the ecological conditions to allow for migration, dispersal, and genetic interchange between grizzly bear recovery zones (figure 33). Figure 34 shows the spatial relationship between the Bitterroot Recovery Zone, the Nez Perce-Clearwater National Forests, and the other grizzly bear Recovery Zones.

Grizzly Bear Recovery Zones, Distributions, and Distinct Population Segments

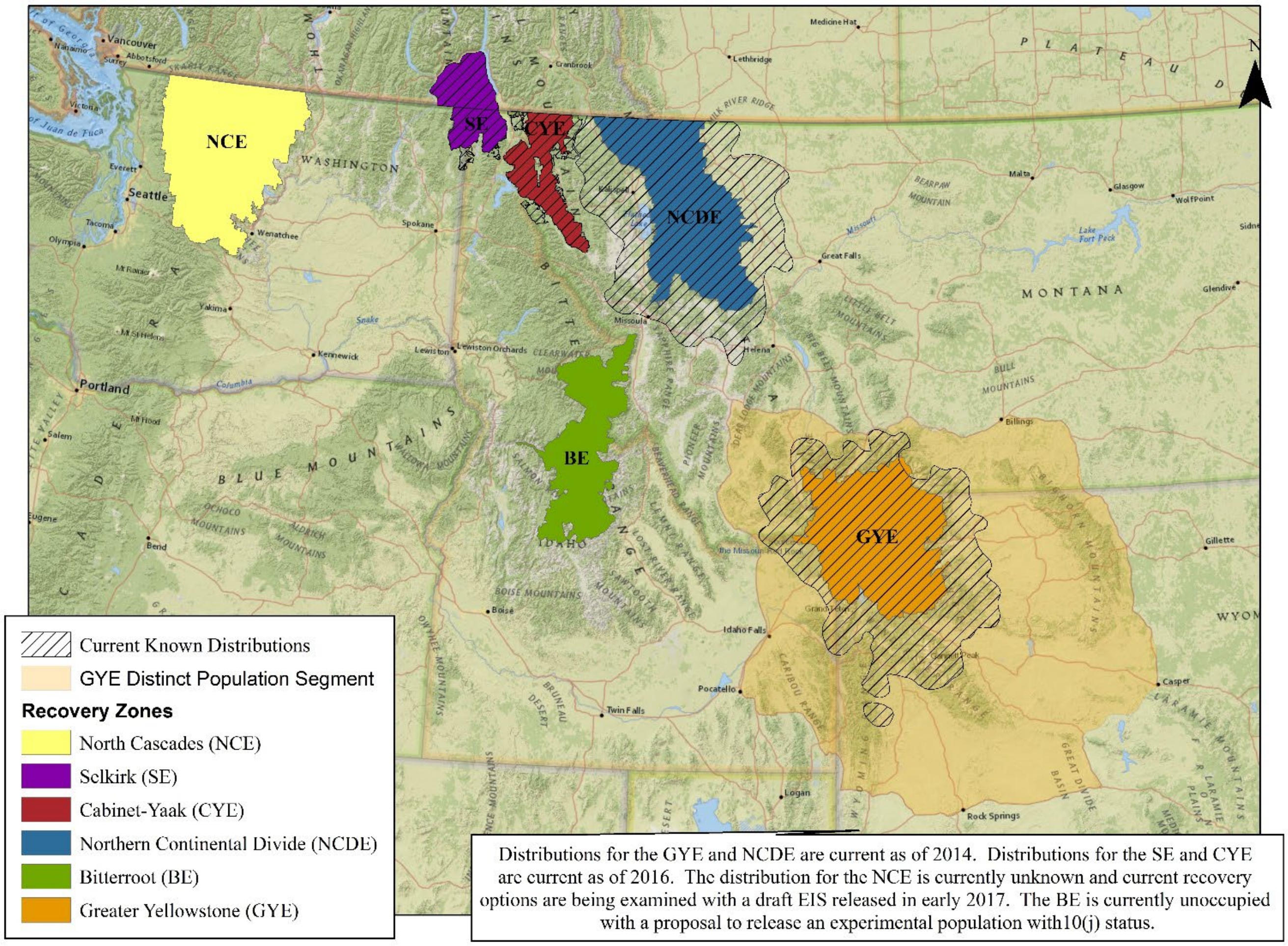


Figure 33. Grizzly bear recovery zones in relation to the plan area and the Bitterroot Recovery Zone

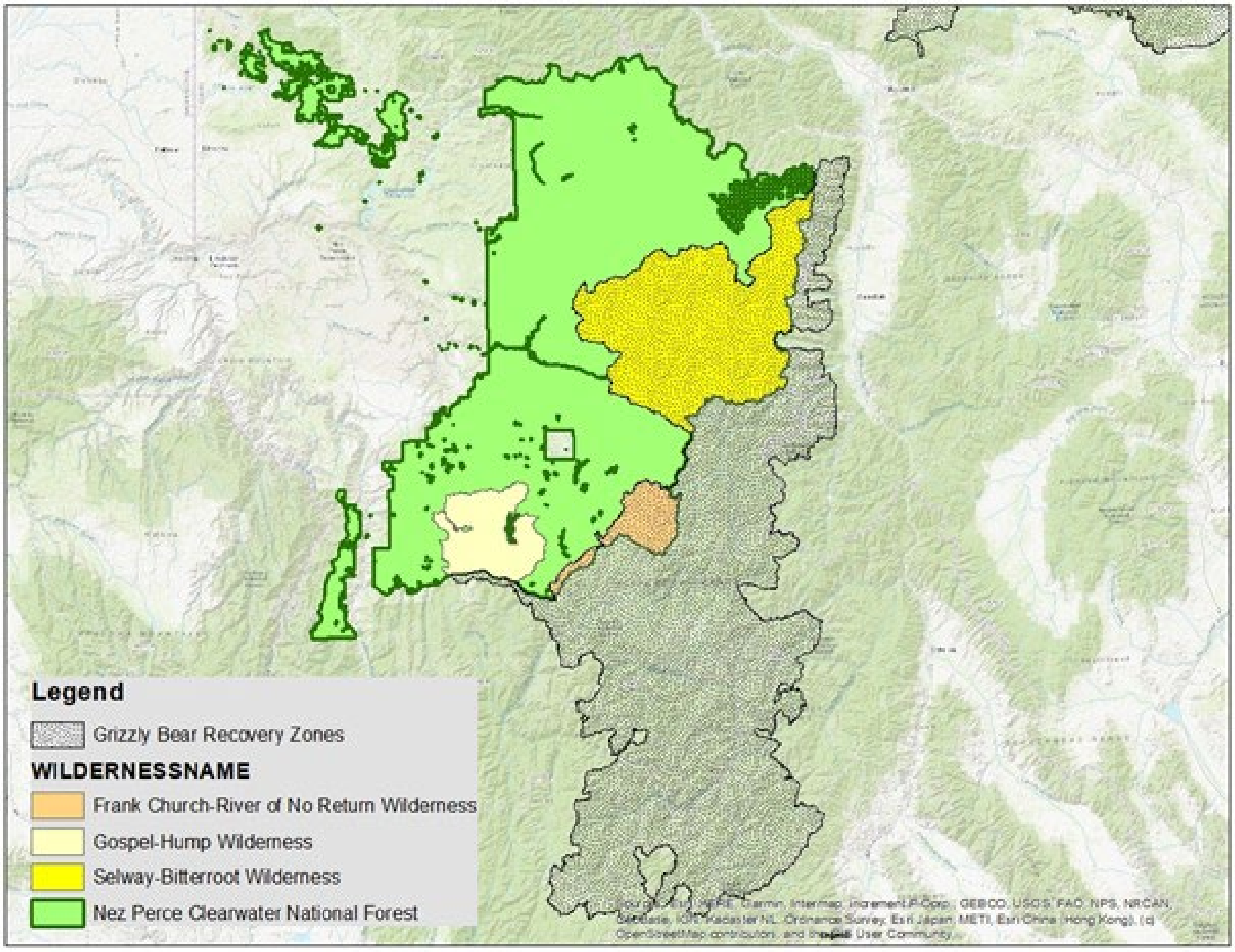


Figure 34. The Bitterroot Recovery Zone (shaded areas) in relation to the Nez Perce Clearwater Planning Area and the Wilderness Areas within the plan area including the Frank Church River of No Return in orange, Selway Bitterroot wilderness area in yellow, and Gospel Hump wilderness Area in light yellow.

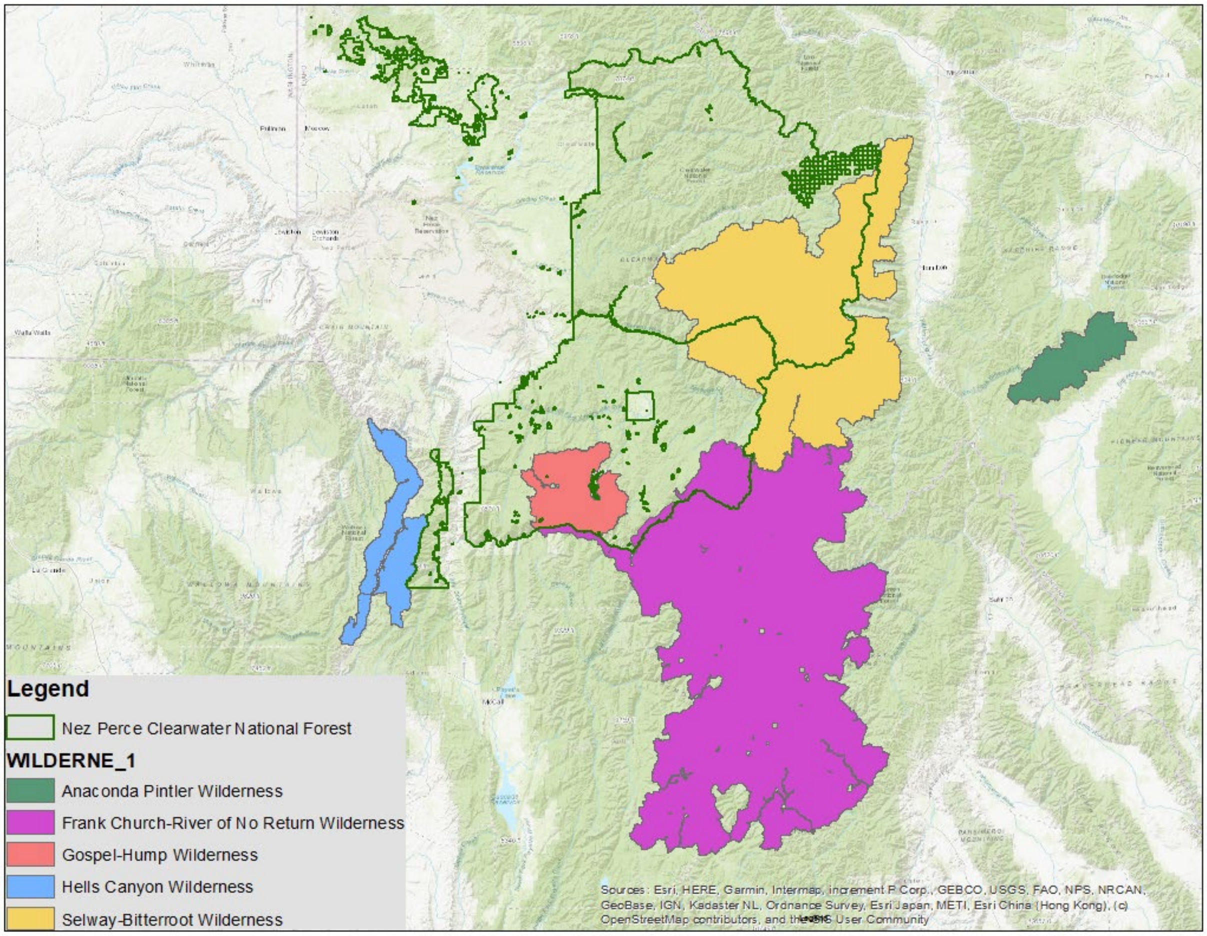


Figure 35. Nez Perce Clearwater lands in relation to the Selway-bitterroot, Frank Church River of No Return, Gospel Hump, and other nearby designated wilderness areas. The Selway-Bitterroot and the Frank Church River of No Return Wilderness areas make up the majority of the Bitterroot Recovery Zone.

Current Status of Grizzly Bear in the Bitterroot Ecosystem

The grizzly bear is native to and was once common in the Bitterroot Ecosystem of Montana and Idaho (Servheen et al. 1995). Members of the Lewis and Clark expedition killed at least seven grizzly bears, including one female and two cubs, while camped near present-day Kamiah, Idaho. Hunters, trappers, and settlers around the turn of the century killed a substantial number of grizzly bears. Conservative estimates indicate trappers and hunters killed 25 to 40 grizzly bears annually in the Bitterroot Mountains until the early 1900s. Sheepherders killed many more in subsequent decades. Ultimately, the grizzly bear population in this area was lost due to high human-caused bear mortality. Prior to recent observations since before 2007, the last verified death of a grizzly bear in the Bitterroot Ecosystem was in 1932 and the last verified tracks were documented in the 1940s (Servheen et al. 1995). In the past half century, several studies, including annual aircraft wildlife surveys by state wildlife personnel, black bear studies, DNA hair snares, and remote camera surveys, have been conducted that were designed to or were likely to have incidentally identified grizzly bear presence in the Bitterroot Ecosystem. However, no grizzly bears were detected by those studies.

Melquist (1985), conducted a survey on the Clearwater National Forest using ground and aerial surveys and grizzly bear observations and compiled 88 reports of grizzly bears between 1900 and 1984. No signs of bears were found during aerial or ground surveys. No verifiable observations were reported. Of the 88 reports, there were 2 confirmed – one from around Grangemont in 1909 and one along Colt Killed Creek near Powell in 1956. However, the 1956 observation was subsequently found to NOT be a grizzly bear. Groves (1987) compiled and reviewed 175 historical grizzly bear reports from central and northern Idaho, including 77 reports on all National Forests except the Sawtooth and Bitterroot from within the Bitterroot Grizzly Bear Recovery Zone. Most of the reports (62) came from the Clearwater National Forest. Groves did not document any additional evidence that confirmed any of the reports. Servheen et al. (1990) and Kunkel et al. (1991) surveyed for grizzly bears during two summers in the Upper North Fork using remote cameras. No photos of grizzly bears were recorded; however, the small area and low camera densities were cited as a reason to caution against confirming the absence of bears. More recently, from 2008 to 2009, Servheen and Shoemaker (2010) conducted a camera and DNA survey of the Bitterroot Mountains. No grizzlies were detected during either the 2008 or 2009 surveys.

The U.S. Fish and Wildlife Service systematically surveyed for grizzly bears throughout the northern Bitterroot Mountains between U.S. Highway 12 in Idaho and Montana Highway 200 and between Missoula, Montana, and Avery, Idaho during 2008 and 2009. Barbed wire DNA hair corrals and remote cameras were deployed. No grizzly bears were detected. While no grizzly bears were detected, their methods did not allow them to conclude that they were absent from the area. A lack of detection was not conclusive evidence that bears were absent. Their failure to document grizzly bears in this survey indicates that if they were regularly occupying the Bitterroot Ecosystem, there were very few individuals and they existed at very low densities (U.S. Department of the Interior 2011b). The U.S. Fish and Wildlife Service considers the Bitterroot Ecosystem to be unoccupied (U.S. Department of the Interior 2021c).

In 2007, a male grizzly bear was accidentally shot and killed on the North Fork Ranger District near Kelly Creek by a hunter who mistook the bear for a black bear. This bear was genetically tested and found to be most closely related to bears in the Selkirk Ecosystem. The distance from the nearest boundary of the Selkirk Ecosystem to the spot where this bear was killed is approximately 141 air miles. The Northern Continental Divide Ecosystem population has been expanding its distribution and a few grizzly bears have been documented to move southward recently. There have been a handful of verified grizzly bear observations in the northwest portion of the Bitterroot Valley and in the Sapphire Mountains. In 2002, a grizzly bear was verified on private property on Sunset Bench southeast of Stevensville, Montana. That bear is thought have crossed the Sapphire Range from the Rock Creek drainage. In October of 2018, a young male grizzly bear was trapped at the Whitetail Golf Course east of Stevensville and relocated to the southern end of the Northern Continental Divide Ecosystem. This bear was trapped about 11 miles from the eastern boundary of the Bitterroot Recovery Zone.

Bear 927, a radio-collared male augmentation bear was released in the West Cabinet Mountains near Spar Lake on July 21, 2018. An augmentation bear is a bear transplanted into the Cabinet Yaak Ecosystem to increase genetic diversity. This bear crossed I-90 on June 4, 2019 and headed south into the Nez Perce-Clearwater. Nearly as soon as he entered the Nez Perce-Clearwater, he was photographed by game cameras near a bear bait operated by an outfitter and guide who has a permit to guide on the Nez Perce-Clearwater. The outfitter reported the observation to the Idaho Fish and Game and the Forest Service shortly after detecting the bear. This bear continued to move southeast through the plan area and crossed into the Bitterroot Recovery Zone near Lolo Pass. Bear 927 spent two months moving around the Bitterroot Ecosystem, including time within the Bitterroot Recovery Zone before heading back north into the Cabinet Mountains to den in October (Costello and Roberts 2021). In 2020 he went northwest upon den emergence and lost his collar. One other observation confirmed as a grizzly bear was made near Lolo pass in 2019 and is suspected to have been bear 927.

A few anecdotes can be inferred from this event. First, the bear was detected quickly after it entered the Nez Perce-Clearwater, suggesting that, if there were other grizzly bears present, they might also be quickly detected by bear hunter's cameras at bear bait sites. Second, the ability of this bear to cross through the northern half of the Nez Perce-Clearwater and into the Bitterroot Ecosystem suggests that the Nez Perce-Clearwater is relatively permeable at least for male grizzly bears.

There were two verified sightings in 2019 south of Grangeville, Idaho of the same individual male bear that was not bear 927. There was another sighting east of Whitebird, ID that was photographed by a game camera over bear bait. It is unknown if the Whitebird sighting was the same bear as near Grangeville (approximately 14 air miles apart). Verified observations of grizzly bears are shown in figure 36 below, which was provided by the U. S. Fish and Wildlife Service's Grizzly Bear Recovery Office on September 6, 2022.

The criteria for a population of grizzly bears was defined in 50 C.F.R. § 17.84(l) after consulting with 37 scientists familiar with bear populations as:

> *"A grizzly bear population is defined by verified evidence within the previous six years, consisting of photos within the area, verified tracks and/or sightings by reputable scientists or agency personnel, of at least two different female grizzly bears with young or one female seen with different litters in two different years in an area geographically distinct (separate) from other grizzly bear populations…"*

Despite the observations, the criteria for a population of grizzly bears have not been met in either the Bitterroot Ecosystem or in the Recovery Zone as defined above. However, grizzly bears may be present as evident from the observations mentioned above (figure 37 below) and was established by the observations shown in figure 36. This figure represents the current distribution of where grizzly bears "may be present," but we acknowledge that where grizzly bears may be present may change over the course of the plan. Grizzly bears are a wide-ranging species and much of the plan area is within the dispersal capabilities of as many as three grizzly bear ecosystems. Based on recent observations of dispersing grizzly bears, additional grizzly bears may enter the forest, and new areas have a high likelihood of becoming areas where grizzly bears "may be present" over the course of the plan.

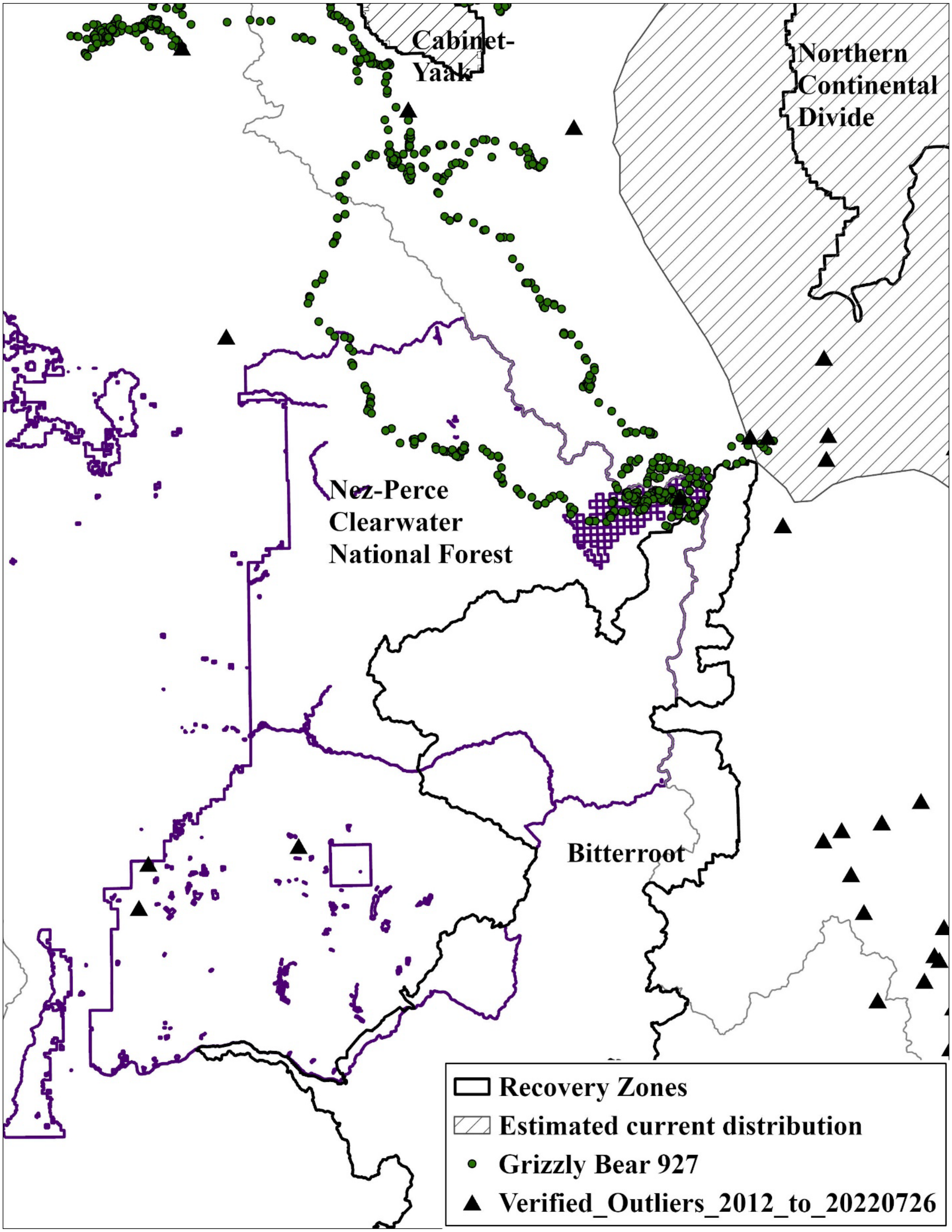


Figure 36 The observations of grizzly bears within the Nez Perce-Clearwater National Forest and the surrounding lands. Verified outliers are grizzly bears who made atypical movements outside of the known estimated current distribution. Note that the bear killed in 2007 is not shown on the map because the observation is more than 10 years old. Map provided by the U.S. Fish and Wildlife Service 9/06/2022.

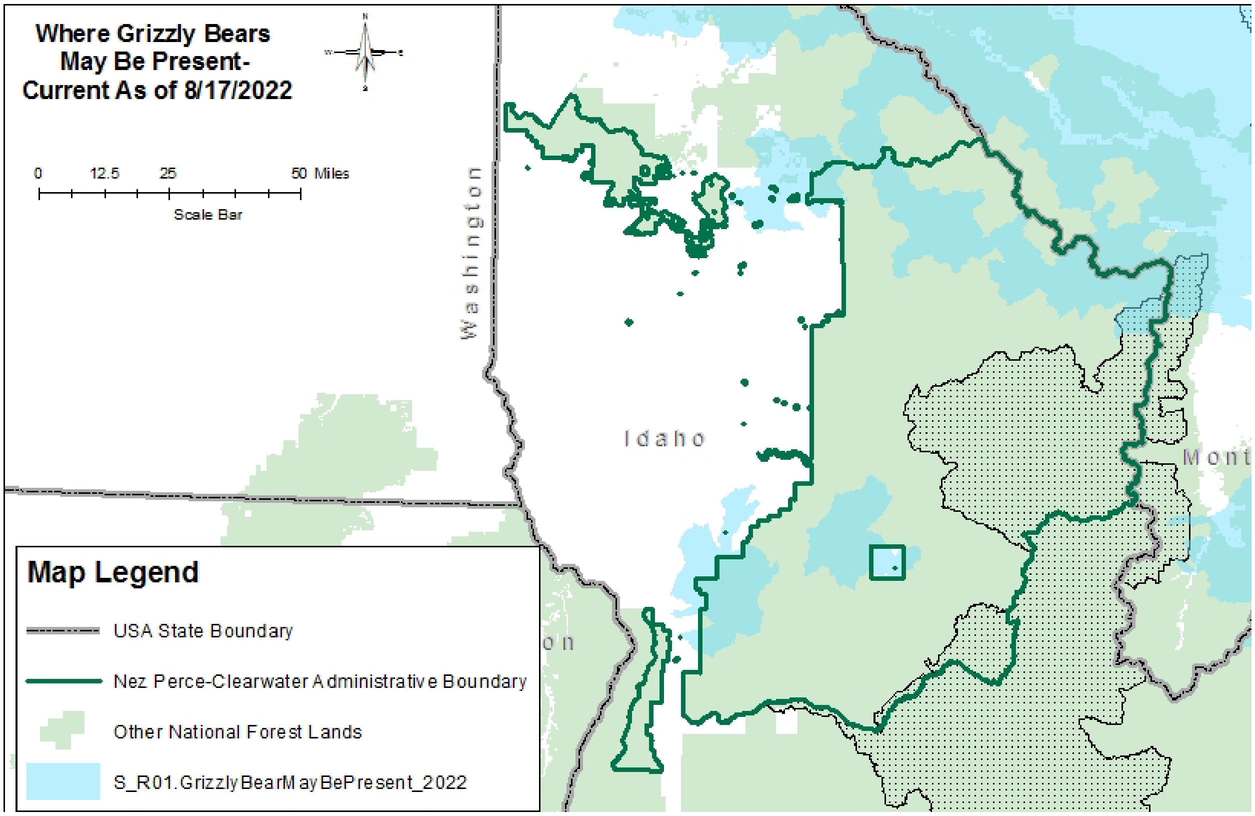


Figure 37. Area where grizzly bears may be present in relation to the Nez Perce Clearwater planning area and the Bitterroot Recovery Zone as of 8-17-2022.

In total, there were three or maybe four male grizzly bears that are known to have entered the planning area in 13 years since 2007. There is no way to know how many bears will enter the planning area, where they will enter, and whether they will stay, but based on current trend, numbers are likely to remain low. It is likely there will be more male grizzly bears moving into the area before females arrive. If the current trend continues, perhaps another three to four male grizzly bears would enter the forest within the life of the plan. If the rate doubles, then perhaps eight male grizzly bears would enter the forest within the life of the plan. It is unlikely that female grizzly bears would enter the forest within the life of the plan due to their reluctance to cross major roadways that exist between the plan area and the other recovery zones. However, the NCDE, and Cabinet Yaak ecosystems are within maximum grizzly bear dispersal of both males and females, while the Selkirk ecosystem is within maximum dispersal distance of male grizzly bears. It is assumed that grizzly bears will continue to recolonize the Bitterroot Ecosystem, albeit slowly (Kasworm et al. 2021). There will not be reproduction until females enter the planning area. The analysis and conclusions about the effects to grizzly bears is therefore hypothetical but is based on factors known to affect grizzly bear survival in other areas. A key indicator for the analysis below is the effects of the plan on secure habitat.

Criteria for Recovery

The Grizzly Bear Recovery Plan (1993), including the Bitterroot Ecosystem Recovery Plan Chapter (Servheen 1996), lays out the criteria needed for recovery. The criteria for when the populations will be viable are when they meet the demographic recovery targets and it can be demonstrated that adequate regulatory mechanisms exist to ensure continued population and habitat management after delisting (U.S. Department of the Interior 1993). The overall goal of the recovery plan is to remove the grizzly bear from threatened status in each of the ecosystems in the 48 conterminous states.

For the Bitterroot Ecosystem, the criterion includes 14 females with cubs over a running six-year average. The method by which this would happen would be through natural dispersal (Federal Register: June 22, 2001, Volume 66, Number 121), however because the final rule was never finalized, 50 CFR § 17.84(l) for the Selway-Bitterroot ecosystem is still technically in effect. The goal for human caused mortality is 0 until at least 90 grizzly bears are established, after which a goal of human cause mortality is not to exceed 4 percent and no more than 30 percent of which would be limited to females. A total of approximately 280 grizzly bears is the tentative long-term recovery objective for the Bitterroot Ecosystem (Supplement: Bitterroot Ecosystem Recovery Plan Chapter (1996)). The recovery plan suggested that management should strive to prevent all human caused mortality within and surrounding the Bitterroot Ecosystem. Naturally, in order to achieve recovery, female grizzly bears must disperse into the Bitterroot Recovery Zone through connectivity from the other grizzly bear ecosystems, and then must reproduce, once established, in order to grow the population.

The grizzly bear recovery plan anticipated that grizzly bears can and will exist outside the boundaries of the recovery zones. The Recovery Plan (1993) recognizes that grizzly bears occasionally will move and even reside permanently in areas outside of recovery zones. It states that:

> *"Bears can and are expected to exist outside recovery zones lines in many areas. However, only the area within the recovery zone will be managed primarily for grizzly bear habitat."*

However, the recovery plan also acknowledged that linkage would be necessary for isolated populations to increase and sustain themselves at recovery levels. The recovery plan (U.S. Department of the Interior 1993) stated that one factor that may affect the sustainability of grizzly bear populations in the future is the ability of individual animals to move between ecosystems. Accurate information is necessary to assess the potential for this type of movement in linkage zones between existing adjacent grizzly bear recovery zones (U.S. Department of the Interior 1993). Future land management activities within these areas may be critical to maintaining their utility as linkage zones (U.S. Department of the Interior 1993). Thus, outside the recovery zones, the emphasis is on linkage zones. Linkage zones are areas between currently separated populations that provide adequate habitat for low densities of individuals to exist and move between two or more larger areas of suitable habitat (U.S. Department of the Interior 2021c).

Habitat requirements and life history

The 2021 Grizzly bear species status assessment (U.S. Department of the Interior 2021c) identified large intact bocks of land, cover, high-caloric foods, and dens as habitat needs for the grizzly bear in the lower-48 States. For demographic needs, it identified connectivity, adequate fecundity and survival, genetic diversity, population trend, and abundance as ecosystem-level needs for resiliency. For analysis of current and future condition, the status assessment selected a subset of these needs, two habitat factors and six demographic factors that are most influential to ecosystem resiliency and that could be measured relatively consistently across all six ecosystems. The two habitat factors and six demographic factors used to evaluate condition were: Natural, high-caloric foods, large intact blocks of land, adult female survival, abundance, population trend, fecundity, inter-ecosystem connectivity, and genetic diversity (U.S. Department of the Interior 2021c).

Habitat Use

Grizzly bears are large animals that have high metabolic demands during the non-denning season. Adequate nutritional quality and quantity are important factors for successful reproduction. Grizzly bears are omnivorous and use a wide variety of habitats, including meadows, shrublands, and forests from valley bottoms through alpine habitats, to locate food sources. Available food sources vary annually, seasonally, and even day-to-day (Mietz 1994). Grizzly bears are dependent upon learned food locations within their home ranges and can switch food habits according to which foods are available (Servheen 1983, Kendall 1986, Mace and Jonkel 1986, Aune and Kasworm 1989b).

Grizzly bears use a wide variety of habitats. Since grizzly bears are generalists with a high variability in diet among individuals, seasons, and years (Servheen 1981, Interagency Grizzly Bear Committee 1987, Aune and Kasworm 1989b, Mattson et al. 1991a, Mattson et al. 1991b, Schwartz et al. 2003, Felicetti et al. 2004, Northern Continental Divide Ecosystem Subcommittee 2013), they generally have an omnivorous diet (Jacoby et al. 1999, Schwartz et al. 2003). The historical distribution of grizzly bears is evidence of their habitat plasticity, as they inhabited diverse ecosystems throughout their historic range from Northern Alaska and Canada south to Central Mexico.

Home range

Adult grizzly bears are normally solitary, except females with cubs or during short breeding relationships. They will tolerate other grizzly bears at closer distances when food sources are concentrated, and siblings may associate for several years following weaning from their mother (Egbert and Stokes 1976). Home ranges of subadult females generally overlap with the maternal home range (Blanchard and Knight 1991). Males consistently exhibit greater indices of movement and less fidelity to home ranges than females (Blanchard and Knight 1991).

Home range size varies with the availability of food resources, sex, age, reproductive status, and other factors (Interagency Grizzly Bear Committee 1987, Blanchard and Knight 1991). Across their range, home range sizes for female grizzly bears are approximately 150 square miles (96,000 acres) (Interagency Grizzly Bear Committee 1987) though habitat quality can affect the size. Females with cubs-of-the-year have the smallest home range sizes (Blanchard and Knight 1991, Mace and Roberts 2011). The annual home range of adult male grizzly bears in the lower 48 States is typically 2 to 3 times the size of an adult female's annual home range (Interagency Grizzly Bear Committee 1987).

No estimates exist for home range size for the Bitterroot Ecosystem so the assumptions are that they would be similar to those in other grizzly bear Ecosystems. Home range sizes are smaller in the NCDE than in the GYE. For example, in the Northern Continental Divide Ecosystem, female annual home range size (95 percent isopleth using the fixed kernel method) ranged from an average of about 50 square miles for females with cubs-of-the-year to an average of about 93 square miles for subadult females (Mace and Roberts 2011). In the Greater Yellowstone Ecosystem, average home range size (using the minimum convex polygon method) was 108 square miles for all adult females and 141 square miles for subadult females (Blanchard and Knight 1991). Annual home range size for adult males in the Greater Yellowstone study area averaged 337 square miles. Home ranges in the NCDE have been reported for female grizzly bears by Mace and Waller (1997) at 48 square miles, and by Aune and Kasworm (1989b) at 159 square miles. In the greater Yellowstone, female home ranges have been reported to average 341 square miles (Blanchard and Knight 1991). Lifetime female home ranges in the Cabinet Yakk averaged 216 square miles (U.S. Department of Agriculture 2020), while those in the Selkirk Ecosystem averaged 161.7 square miles (U.S. Department of Agriculture 2020). Young, female grizzly bears usually establish home ranges within or overlapping their mother's and this pattern of home range establishment can make dispersal of females across landscapes a slow process (U.S. Department of the Interior 2021c). According to the Grizzly Bear Species Status Assessment (U.S. Department of the Interior 2021c), grizzly bear females average 138 mi^2 in the NCDE, 50mi^2 in the Greater Yellowstone Ecosystem, 127 mi^2 in the CYE, and 115 mi^2 in the SE. Male grizzly bear's home ranges average 527 mi^2 in the NCDE, 183 mi^2 in the Greater Yellowstone Ecosystem, 835 mi^2 in the CYE, and 241 mi^2 in the SE. Home range size is affected by resource availability, sex, age, and reproductive status (U.S. Department of the Interior 2021c). Estimates of home range size can also be influenced by the timeframe through which data were collected, and the method used to delineate them from telemetry data. For examples of home range methods include minimum convex polygon method, kernel density estimators and so forth. This analysis assumes that grizzly bear home ranges would range in size somewhere between the estimates above. Home ranges sizes are useful consideration for evaluating effects of future projects against baseline conditions, and each new project conducted under the direction of the Revised Forest Plan will undergo site specific analysis and consultation for effects to grizzly bears.

The sizes of female home ranges have informed the size of management units within recovery zones such as Bear Management Units (BMU's) and subunits. Bear management units (BMU's) and subunits are analysis areas delineated by the Interagency Grizzly Bear Committee and were established to meet recovery criteria outlined in the recovery plan (U.S. Department of the Interior 1993) BMU's have been delineated typically only within recovery zones and have not been delineated in areas outside of recovery zones. BMU's in other recovery zones vary in size from approximately 250 km^2 (96 mi^2) to 1,380 km^2 (532 mi^2) and were usually delineated using topographic and hydrologic features. BMU's are established by the Interagency Grizzly Bear Committee when appropriate. Thereafter, BMU's were adopted as the boundaries to establish conservation measures in land management plans such as forest plans. Neither BMU's nor subunits have been established within the Bitterroot Recovery Zone.

The plan does not include direction for BMUs nor subunits; however, these are typically established by the Interagency Grizzly Bear Committee and can be implemented outside of the Forest Plan. Also given the limited use by grizzly bears no estimate exists for home range size in the Bitterroot Ecosystem, as such this analysis assumes that grizzly bear home ranges would be like those in other ecosystems. Each new project conducted under the direction of the Revised Forest Plan will undergo site specific analysis and consultation and at that time best available science will guide the analysis for grizzly bear both within and outside the Bitterroot Recovery Zone. There is no available data to inform the size of grizzly bear home ranges within the Bitterroot Ecosystem.

Denning

Grizzly bears are quite variable in their selection of denning habitat and structures (Schwartz et al. 2003). Grizzly bears usually dig dens on steep slopes where wind and topography cause an accumulation of deep snow and where the snow is unlikely to melt during warm periods. In addition, grizzly bears are more likely to den in areas with greater canopy cover (Pigeon et al. 2016) and at elevations above 6,371 feet (greater than 1,942 meters) (Mace and Waller 1997). Grizzly bears usually excavate their dens for hibernation in areas that will be covered with a blanket of snow (Craighead and Craighead 1972). Grizzly bears generally enter their dens from September to November and remain until mid-March or late April (Dood et al. 2006). Males typically enter dens later in the fall and emerge earlier in the spring than do females. Both males and females have a tendency to use the same general area for hibernation year after year but the same den is rarely reused by an individual (Linnell et al. 2000). In the Northern Continental Divide Ecosystem, most grizzly bear dens were documented at elevations above 6,400 feet in northwestern Montana (Mace and Waller 1997) with the average elevation somewhat higher on the Rocky Mountain front (Aune 1994). Upon emergence from the den, grizzlies move to lower elevations, drainage bottoms, avalanche chutes, and big game winter ranges to exploit spring food resources.

Diet

Grizzly bears have a high degree of dietary plasticity and are capable of shifting to alternate food sources when key food items are scarce or unavailable. Gunther et al. (2014) documented 266 species of plant, animal, fungi, algae, and soil consumed by grizzly bears in the Greater Yellowstone Ecosystem. Important food items include berries, ungulate biomass, mast (e.g., whitebark pine seeds), ants, clover, dandelion, vegetation, and fish. Grizzly bears use numerous different habitats for foraging. Use tends to be more frequent in areas that offer some type of hiding cover nearby, particularly during daylight hours (Aune and Kasworm 1989b, Mace and Waller 1997). Waller (1992) reported that grizzly bears avoided lower-elevation, more accessible harvested stands, as well as stands less than 30–40 years old where the vegetation had not recovered enough to provide cover. Vegetation management may alter the amount and arrangement of cover and forage available to bears. Timber harvest and fire can locally increase bear foods by stimulating the growth of grasses, forbs, and berry-producing shrubs. Associated roads and human activity can negatively affect grizzly bears by disturbing or displacing bears during logging activities and by increasing mortality risk (Zager et al. 1983).

Grizzly bears have a strong sense of smell which they use to find food sources. They are known to travel far distances following their sense of smell to find forage. They also tend to return to high quality nutritional resources repeatedly and habitually as a strategy to gain weight to meet the demands of hibernation. Their keen sense of smell sometimes leads them to human foods and attractants that lead to conflicts and affects their survival. Human-grizzly bear conflicts can be caused by unsecured attractants, habituation to human presence, and food conditioning of bears. These conflicts lead to grizzly bear mortality or removal (Knight et al. 1988). Developed recreation sites that support overnight public use are thought to have a higher potential to increase both the levels of bear attractants and grizzly bear mortality risk (Northern Continental Divide Ecosystem Subcommittee 2018).

Secure Habitat and Motorized Access

Historically, grizzly bear populations persisted in landscapes without permanent human presence where the frequency of contact with humans was low (Mattson and Merrill 2002). Maintaining large blocks of secure habitat is important to the survival and reproductive success of grizzly bears, especially females (Mace et al. 1999, Schwartz et al. 2010b). The most important predictors of survival in the Greater Yellowstone Ecosystem were the amount of secure habitat within a bear’s home range and road densities outside of secure habitat (Schwartz et al. 2010b). In the Northern Continental Divide Ecosystem, human-caused mortality was the most important factor driving grizzly bear survival rates (Mace et al. 2012). The majority of management removals of grizzly bears resulted from human-bear conflicts at sites with frequent or permanent human presence and unsecured attractants, such as garbage, human foods, pet and livestock foods, and orchard fruit.

Numerous studies using various methods have documented that roads in grizzly bear habitat affect behavior and habitat use and can lower a bear survival rate during the non-denning season (Mattson et al. 1987, McLellan and Shackelford 1988, Mattson et al. 1996, Waller and Mace 1997, Boulanger and Stenhouse 2014). Research demonstrates that roads and associated human activities impact grizzly bears during the non-denning season by displacing them from important habitats and lowering their survival and reproduction rates (Mattson et al. 1987, McLellan and Shackelford 1988, Mace and Waller 1996, Boulanger and Stenhouse 2014). Displacement may be responding with a relatively short term – short distance response or may be displaced with a longer-term avoidance response and movement to another area. Motorized access can affect bears by increasing human interaction and the potential for conflict, increasing the chance of habituation to humans, and increasing energetic requirements related to disturbance by humans (U.S. Department of the Interior 2011b). Displacement from habitat and/or increased stress levels may be especially problematic for female grizzly bears attempting to reproduce by causing decreased nutritional status (Mattson et al. 1987). The amount and pattern of motorized access in grizzly bear habitat is a stressor that can be influenced by Forest Service management of National Forest System lands.

Although road density provides a tool to describe human-caused effects to grizzly bears based on existing literature, it fails to consider traffic volume, proximity to forage resources and how road placement affects habitat patch size (Proctor et al. 2019). Secure areas are a major component of grizzly bear habitat because they provide opportunities for bears to meet energetic needs with low potential for disturbance from human intrusions.

Studies have shown that female grizzly bears selected for, or survived better in, areas with greater secure habitat (Mace et al. 1996, Wakkinen and Kasworm 1997). Mace et al. (1996) showed females selected for home ranges with 56 percent secure habitat compared to 30 percent secure habitat outside the composite female home ranges. Across the border in Canada, researchers found that female grizzly bears selected for, and survived better in, areas with 56 percent secure habitat as compared with available areas with 46 percent secure habitat (Proctor et al. 2019).

The Grizzly Bear Recovery Plan (U.S. Department of the Interior 1993) noted that the most crucial element in grizzly recovery is securing adequate effective habitat for bear populations, which include food, cover, denning habitat, solitude, and space (Craighead and Mitchell 1982). With respect to grizzly bears, habitat is 'secure' generally when recurring human use is low. For the purposes of conservation and recovery of grizzly bear populations, secure habitat has commonly been defined as areas of a specified minimum size that are beyond a specified distance from motorized routes (Mace et al. 1996, Boulanger and Stenhouse 2014). Grizzly bear secure habitat is defined slightly differently in grizzly bear literature and in different conservation strategies.

Female home-range selection and/or survival also has related to the proportion of habitat > 500 meters from an open or gated road, often termed 'secure habitat' (Proctor et al. 2019). Wakkinen and Kasworm (1997) demonstrated that smaller-sized core blocks tended to be underutilized by their study animals – particularly those of less than two square miles (1,280 acres). However, while more than 97 percent of the use by successfully reproducing females occurred in blocks greater than two square miles, actual use occurred in blocks as small as 0.22 square miles (141 acres). However, there has not been any studies that identify the minimum size of secure habitat that grizzly bears will use.

Human use of public lands is highly correlated to the availability and distribution of motorized access. The intersection between secure habitat and motorized use occurs due to associated mortality factors such as bear-vehicle collisions, potential lawful or illegal hunter harvest, and interaction with humans. Jaeger (Jaeger 2000, Jaeger et al. 2005) found the distribution and configuration of roads can influence secure habitat patch sizes significantly. For instance, even in areas with overall low road density, there may be patches of high road density interspersed with patches of low road density or unroaded areas, influencing how grizzly bears use the landscape. Identifying secure habitat incorporates the effects of motorized use while better addressing spatial issues associated with variable road density within an area.

Schwartz et al. (2010a) determined that secure habitat within female home ranges had a larger influence on their survival than road densities. Schwartz (2010a) suggested that secure habitat is correlated with road densities but provided distinct and important contribution to grizzly bear survival modeling and showed that increased road density had a greater effect on predicted survival as secure habitat decreased. The most important predictors of survival in the best survival models were the amount of secure habitat within a bear's home range and road densities outside of secure habitat (Schwartz et al. 2010a). They concluded that managing the landscape to reduce hazards to grizzly bears requires balancing road density standards with the amount of secure habitat available (Schwartz et al. 2010a). Multiple studies concluded general that areas with a higher percentage of secure habitat showed greater selection for and survival of female grizzly bears (Mace et al. 1996, Wakkinen and Kasworm 1997, Gibeau et al. 2001). The amount of secure habitat metric more adequately represents the potential effects related to motorized access as it provides a more accurate indication of the spatial mix of motorized routes and secure habitat (Proctor et al. 2019).

Winter Recreation

The impacts of winter recreation activities on denning bears are not well studied. The Grizzly bear Species Status Assessment (U.S. Department of the Interior 2021c) suggested it is important to consider the potential impact from winter recreation because grizzly bears are easily awakened in their dens. It also suggested that disturbance of grizzly bears in the den can result in cub abandonment or early den exit, which could kill a grizzly. The Species Status Assessment (U.S. Department of the Interior 2021c) found no studies in the peer-reviewed literature documenting the effects of snowmobile use on any denning bear species and no records of litter abandonment by grizzly bears in the lower-48 States due to snowmobiling; the information that is available is based on opportunistic sightings and small sample sizes for example Hegg et al. (2010). The Species Status Assessment cited evidence from studies from Scandinavia (Swenson et al. 1997) suggesting that abandonment is possible as a result of den disturbance.

Reproduction and Dispersal

Grizzly bears live at relatively low population densities, disperse slowly, and are vulnerable to human-caused mortality. Female grizzly bear dispersal occurs gradually over several years and over short distances (McLellan and Hovey 2001b, Proctor et al. 2004, Proctor 2015). A genetic analysis to estimate dispersal distances in Canada estimated the average dispersal for female grizzly bears was about 8.9 miles and about 26 miles for males away from their natal home ranges (Proctor et al. 2004). Another study used radio collared and marked bears to estimate dispersal after family break up (McLellan and Hovey 2001b). McLellan and Hovey (2001a) measured the distances between the home range center of a mother and her dispersed offspring over 20 years. Their study looked at 30 offspring, 12 females, and 18 males. This study suggested that female bears dispersed about on average 6 miles from their natal home range between one to four years after the family break up. Males in this study dispersed on average 18.5 miles from their natal home range. The farthest distances dispersed were 41.6 miles for males and 12.42 miles by females in this study.

On average, females reach sexual maturity sometime between four and seven years of age and give birth to one to three cubs about every three years (Schwartz et al. 2003). Depending upon where female grizzly bears eventually enter the forest, it could take generations of females living in portions of the Forest before they reach the Bitterroot Recovery Zone. There are no known recent observations of female grizzly bears within the plan area since they were extirpated. According to the U.S. Fish and Wildlife Service, a female known as Ethyl passed within approximately 6.2 miles (10 km) from the forest's northern boundary. Ethyl was a management bear that was relocated several times and exhibited unusual, very long-range movements in response to relocation, that are not typical of most female grizzly bears. This female returned to the NCDE and dropped her radio collar which at the time was very far from the plan area boundaries.

Most females demonstrate smaller dispersal ranges, long-distance dispersal does occur occasionally. The next closest female locations are approximately 25 miles (40 km) away and north of I-90. The closest verified sighting of a known female was approximately 37 miles (60 km) to the east, south of I-90. Females typically establish home ranges 6 to 8.8 miles (9.8 to 14.3 km) away from the center of their mother's home range. However, long-distance dispersal by females has been documented up to 49.7 to 55.9 miles (80-90 km), typically on the edge of expanding populations. While it is unknown how long it will take females to enter the plan area, given the normal dispersal tendencies of female grizzly bears, it could be a long time until female grizzly bears disperse onto the forest, but we cannot discount that females could arrive earlier. Thus, female dispersal into the Forest during the life of the Forest Plan has a low probability but cannot be discounted.

Proctor et al. (2012) used genetic data from 3,134 grizzly bears along with radio telemetry location data from 792 grizzly bears across the distribution in western Canada and northern United States to assess large-scale movement patterns and genetic connectivity among bear populations. In the northern more remote portion of their distribution, grizzly bear populations were found to be well connected with movement, dispersal, and gene flow influenced by distance and natural topographic features such as icefields, as would be expected. In contrast, in the southeastern part of their distribution, rates of movement and genetic interchange were impaired. Population fragmentation in these areas were associated with human settlements, highways, and human-caused mortality. Maintaining or improving connectivity is critical for isolated populations, such as the Greater Yellowstone Ecosystem; small populations, such as in the Cabinet-Yaak Ecosystem; and unoccupied areas, such as the Bitterroot Ecosystem. Proctor et al. (2012) found that male grizzly bears generally move more frequently and over longer distances than females. The maximum dispersal distances estimated by Proctor et al. were about 47 miles for a female and 104 miles for a male. The distance between the currently occupied areas around the Northern Continental Divide Ecosystem to the Bitterroot Ecosystem are approaching or within the dispersal range of female bears.

It is to be expected that any grizzly bears outside the recovery zones are likely to experience a higher level of adverse impacts and will occur at lower densities than within the recovery zones. Nevertheless, Section 9 of the Endangered Species Act prohibition against "taking" applies irrespective of where the animal occurs, and the areas outside recovery zones can play a significant role in supporting movement of bears between Recovery Zones. Successful dispersal of bears is important to enable recolonization of vacant habitat (i.e., improving redundancy/ security against stochastic events across the range); bolster small populations, such as in the Cabinet-Yaak Ecosystem; and provide genetic connectivity between the other ecosystems and the isolated population in the Greater Yellowstone Ecosystem.

Threats and Stressors to Grizzly Bears

Interactions with people are by far the leading factors affecting grizzly bear populations. Motorized access routes (roads and trails) detract from secure habitat and has been shown in several studies to displace bears and adversely affect grizzly bear survival because it brings people in proximity to bears. The Interagency Grizzly Bear Committee (1994;1998) recognized the impacts of human access on grizzly bear habitat. Specifically, motorized vehicle access has been shown to increase human interactions with bears and potentially increase associated grizzly bear mortality risk, increase grizzly bear displacement from important habitats, increase bear habituation to human presence, reduce reproduction, and reduce habitat security. Motorized access routes (roads and trails) and areas of concentrated human use (developed site footprints) detract from secure habitat.

The same likely holds true for grizzly bears that inhabit or pass through the Nez Perce-Clearwater National Forest. Permitted livestock grazing allotments contain live animals, livestock feed and supplements, and occasionally livestock carcasses that may attract grizzly bears into potential conflict situations with people. Developed sites provide places for people to concentrate use, which can contribute disturbance factors that may displace wary bears, while at the same time storing, preparing and eating food, or disposing of garbage, which may act as attractants for less wary bears. Availability of secure habitat, key natural food sources, and human-related attractants, can influence grizzly bear survival, reproductive success, and distribution.

According to the recovery plan, mortality from direct and indirect sources within and surrounding the Recovery Zone must be addressed if grizzly bears are to recover (Servheen 1996). Sources of direct mortality include illegal killing, accidental deaths, and management associated removals. Accidental deaths include mistaken identities by black bear hunters and other big game hunters, road kills, or handling errors when bears are captured for management or research. Mortality can also result from control actions by private citizens, such as livestock operators, apiarists, outfitters, resort operators, landowners protecting their property, and by hunters defending their kills. Direct mortality may also occur during agency control of nuisance bears for livestock conflicts, property damage, or situations threatening to human life or self-defense (Servheen 1996). Indirect mortality includes deaths that occur with actions that bring bears and people into conflict, such as road use, land development, and recreation (Servheen 1996). The grizzly bear recovery plan recommends that every effort should be made to limit mortality to zero in the initial phases of recovery when the number of bears will be low.

The recent five-year review of grizzly bear recovery (U.S. Department of the Interior 2021c) evaluated stressors and other actions that can positively or negatively affect grizzly bears. Stressors were fit into three broad categories including those with habitat-related effects, sources of human-caused mortality, and other stressors. Stressors with potential habitat-related effects include: motorized access and its management; developed recreation sites; livestock allotments; mineral and energy development; recreation; vegetation management; habitat fragmentation; development on private lands; and activities that may disturb dens. Sources of human-caused mortality included: management removals; accidental killings (e.g., train and vehicular strikes); mistaken identity kills; illegal killings; and defense of life kills. Other stressors included: natural mortality; connectivity and genetic health; changes in food resources; effects of climate change; and catastrophic events, earthquakes, and volcanic eruptions. The stressors above will be evaluated below as to how the plan addresses or ameliorates these factors.

Some research has been conducted on potential winter recreation effects on grizzly bears by identifying the characteristics of grizzly bear denning habitats from telemetry data, then use geographic information systems to project or model areas of the landscape that have these characteristics, and then evaluate the spatial overlap of modeled denning habitat with winter recreation use areas. For example, Podrunzny (2002) used modeling to evaluate the potential effects of winter recreation on grizzly bear denning in the Greater Yellowstone Ecosystem. These studies suggest potential for disturbance to denning bears (Podruzny et al. 2002). These types of studies are not available for the Bitterroot Recovery Zone.

In order to be considered the best available scientific information, the science should be accurate, reliable, and relevant as described above and in the directives for the 2012 Planning Rule(U.S. Department of Agriculture 2015). There are three documents that are not considered to be the best available scientific information for grizzly bears for reasons related to their accuracy, reliability, and relevance (U.S. Department of Agriculture 2015). The specific documents are titled “The Grizzly bear Promised Land, Past, Present and Future of Grizzly Bears in The Bitterroot, Clearwater, Salmon and Selway Country” authored by David Mattson (2021), “Grizzly Bear Denning Habitat and Demographic Connectivity in Northern Idaho and Western Montana” authored by Mike Bader and Paul Sieracki in (2021) and “Grizzly bear denning habitat and demographic connectivity in northern Idaho and western Montana” by Mike Bader and Paul Sieracki which was published in Northwestern Naturalist (Bader and Sieracki 2022). Mattson (2021) and Bader and Sieracki (2021) have not undergone peer review, and are considered gray literature produced by non-governmental organizations. Bader and Sieracki (2022), while peer reviewed, is based on the same data and very similar analysis and contains some of the same challenges with assumptions and methodology that Bader and Sieracki (2021) has.

Mattson (2021) was recently reviewed by the Bitterroot Science Team of the Interagency Grizzly Bear Bitterroot Subcommittee (U.S. Department of Agriculture 2023). The Science Team review summarized this document as follows” “The Mattson monograph is not peer-reviewed and was self-published by the non-profit advocacy group Grizzly Bear Recovery Project. It draws upon a broad range of literature across numerous topics to explore “the past history, present conditions, and future prospects of grizzly bears and... habitat (p. 4) in central and north-central Idaho. Importantly, Mattson’s monograph presents little new information, infers certainty from historic information that is impossible to verify, relies on gray literature that has not been peer-reviewed, and extrapolates from peer-reviewed literature beyond their scope. The author presents analysis specific to projected population viability, delineation of Bear Management Units, and existing habitat security. However, these analyses have not undergone peer-review, nor can such a review be conducted based upon the information provided; the document does not describe the methods and assumptions used in a clearly articulated fashion that is typical of peer-reviewed publications. Without such detail it is impossible to replicate the study or further test the assumptions made in the document, which makes it likewise impossible to weigh the value and validity of the modeled findings. In many cases, the author also does not clearly identify the data sources used. Mattson's conclusions are over-confident at times and strained by data limitations and layered assumptions, particularly with respect to historic and existing conditions on the Nez Perce-Clearwater National Forest. The author acknowledges some of the constraints and limitations of his review, as well as the need for additional research in multiple areas." The accuracy is questionable because of the layered assumptions, reliance on gray literature, extrapolation of peer reviewed literature beyond their scope, and lack of peer review. In short, the reliability of Mattson's monograph is questionable because of the lack of supportable evidence of current and historic conditions, and its results and conclusions cannot be regarded as the best available scientific information because it is not accurate, nor reliable (U.S. Department of Agriculture 2015).

Bader and Sieracki (2021) and (2022) used grizzly bear den locations to model grizzly bear denning habitat. They obtained data for a number of bear den sites to derive characteristics of den sites and then modeled denning habitat across a wider area. The 2021 study was not peer reviewed and was funded by advocacy groups. A subsequent study based on the same data and similar analysis was published in the Northwestern Naturalist in 2022 (Bader and Sieracki 2022).

These two documents (Bader and Sieracki 2022) and (Bader and Sieracki 2021) were reviewed by a team of wildlife biologists made up of representatives from the U. S. Forest Service and U. S. Fish and Wildlife Service. The team produced a written document to evaluate the merits of these studies. The review concluded that there are substantial concerns regarding their methodology and conclusions, as well as statements about research and current management direction. They state that the non-peer-reviewed version (Bader and Sieracki 2021) was widely distributed in 2021 and should not be cited or used. For the review of the 2022 publication (Bader and Sieracki 2022), the team cited concerns about assumptions, data analysis, statistical irregularities, geographic information systems irregularities, a temporal mismatch of denning locations and motorized data, inadequate evaluation of results compared to other studies, biased interpretations of results and unrelated management recommendations in conclusions as problematic. The Review Team does not regard (Bader and Sieracki 2022) as best available science due to its numerous issues with accuracy and reliability. These two publications are not considered best available science in this analysis for the same reasons.

Evidence from published literature on dens suggests that mortality, or poor outcomes during denning season are rare or uncommon. There is not much evidence in peer reviewed literature, even after observing hundreds of denning bears, that den site quality matters in terms of survival or reproductive success. Aune and Kasworm (1989a), observed 68 dens, but did not mention any failed dens, Craighead and Craighead documented 11 dens from 22 bears, but did not mention failed dens, (Kasworm et al. 2021) evaluated 129 dens from 1983 to 2020 and noted no grizzly bear mortality was observed during the denning season. Servheen and Klaver (1983) studied ten dens used by radio equipped bears but did not report mortality from failed or abandoned dens. Linnell (2000) evaluated dozens of studies on dens of black bear, polar bear and brown bears. Linnell (2000) reported den abandonment, mostly in relation to human disturbance within the immediate area early in the denning season. While Linnell (2000) did identify some dens being abandoned because of flooding, the study did not otherwise identify any differences in survival or outcome related to den site quality. Linnell (2000) noted that when dens were abandoned, bears often reinitiated new dens soon after. While grizzly bears prefer denning areas with some characteristics, there appears to be limited consequences to dens located in less preferred areas.

Existing condition

Existing Direction In 1987 Plans

The grizzly bear was listed as a threatened species in the lower 48 states on July 28, 1975. No critical habitat has been designated. The historical range of the grizzly bear in the continental United States extended from the central Great Plains, west to California, and south to Texas and Mexico. Between 1800 and 1975, grizzly bear populations in the lower 48 states declined from over 50,000 to less than 1,000. As European settlement expanded westward, the grizzly bear was extirpated from most of its historical range (U.S. Department of the Interior 1993). Until recently, the grizzly bear was considered extirpated from the plan area.

Management Direction Under the 1987 plans for the Nez Perce and Clearwater Forest contain elements that contributed to grizzly bear recovery. The Nez Perce Forest Plan (1987b) has forest wide direction as amended states:

> *"The Forest will cooperate in the recovery of species listed in accordance with the Endangered Species Act."*
>
> *"In compliance with assigned objectives in the Grizzly Bear Recovery Plan, the present status of the grizzly bear will continue to be monitored and updated. Habitat within the Selway Bitterroot Grizzly Bear Recovery Zone will be inventoried and evaluated to determine its capability to support viable grizzly bear populations. Established proactive actions will be exercised in accordance with current federal and state regulations."*
>
> *"In compliance with sub-section 7(a)(2) of the Endangered Species Act a biological evaluation will be prepared (as described in FSM 2672.42) for all proposed management activities."*

The grizzly bear was a Management Indicator Species on the Nez Perce National Forest as well.

The Clearwater National Forest Plan (1987a) also contains elements or direction for grizzly bears as follows:

> *"Manage habitat to contribute to recovery of each threatened and endangered species occurring on the Forest, including the grizzly bear, gray wolf, and bald eagle."*
>
> *"Cooperate with future recovery efforts on behalf of the gray wolf, bald eagle, and grizzly bear."*

The 1987 plans have elk plan components that contribute to conserving habitat for future grizzly bear occupation via management of elk habitat effectiveness and elk vulnerability. These plans manage elk habitat effectiveness and elk vulnerability through roads management and use, and other factors (Leege 1984, Servheen et al. 1995). The elk vulnerability (EV) model estimates the effects of access and hunter effort activities during fall hunting seasons on elk at the game management unit scale. It considers both open and closed roads in the calculation of elk habitat effectiveness.

Direction in the 1987 forest plans required lands to provide for elk by maintaining areas with specified amounts of elk habitat potential. The 1987 plans imposed standards that required different areas to maintain certain levels of elk habitat potential. The elk habitat potential standards were associated with land allocations in the 1987 plans and elk habitat effectiveness (EHE) was the metric used to calculate elk habitat potential. The 1987 plans standards required projects to analyze factors, such as road density, livestock grazing, in relation to elk habitat preferences including quality, quantity, and distribution of cover, forage, and security areas. The Clearwater Plan was later amended and emphasized elk habitat effectiveness and reducing elk vulnerability. The 1987 Plans from both forests used elk analysis units as the scale for which effects were analyzed. The plans standards required that each elk analysis unit were identified to maintain a minimum amount of elk habitat effectiveness of either 25 percent, 50 percent, 75 percent, or 100 percent. Elk Analysis units are not delineated within wilderness.

The U.S. Fish and Wildlife Service issued the Forests interim direction for section 7 consultation for considering grizzly bear habitat management in or adjacent to the Bitterroot Ecosystem in (1995a) as a result of efforts to reintroduce grizzly bears into the Bitterroot Recovery Zone (Letter from Fish and Wildlife Service dated November 13th, 1995). Direction from the U.S. Fish and Wildlife Service in that letter was that the Forest Service should

> *"consider the effects to grizzly bear habitat as being incorporated into the analysis for big game habitat. As long as the Forest Plan Standards for big game are being met, and/or big game issues are sufficiently covered within NEPA documents, projects would be considered to be in compliance with section 7(a)(1) of the Endangered Species Act. In addition, grizzly bear habitat will be incorporated into effects analysis and management direction for big game habitat. If big game issues are properly dealt with in the NEPA process then it will be assumed that grizzly bear habitat issues are also adequately addressed."*

This was given as interim guidance (USFWS Letter to the U.S. Forest Service, November 13th, 1995). In response, the Forest Supervisor wrote a letter directing the District Rangers (Letter written by James Caswell, Forest Supervisor to District Rangers, December 4, 1995) that:

> *"If big game issues are properly dealt with in the NEPA process then it will be assumed that grizzly bear habitat issues are also adequately addressed."*

In 2008 when the Idaho Roadless Rule was established, many areas that had objectives for elk analysis units to maintain 75 percent and 100 percent habitat effectiveness, were identified as having roadless character and thus were designated as Idaho Roadless Rule Areas, though the process for identification of areas with roadless character were not directly related to elk measures. Elk and grizzly bears both prefer to use and survive better in habitats without motorized access. The restrictions on activities in the Idaho Roadless Rule Areas established a new mechanism to provide ecological conditions to contribute to grizzly bear recovery because the roadless rule restricts road construction or reconstruction, timber and vegetation management, and some mineral uses as outlined above in the "Other Management Direct" describing the Idaho Roadless Rule direction table 23. These new mechanisms imposed by the Idaho Roadless Rule, in part, replaced the need for elk habitat effectiveness measures in the proposed plan within Idaho Roadless Rule Areas.

The existing road and motorized trail, along with newly proposed routes, are one the main factors calculated that determines elk habitat effectiveness outcomes within each elk analysis unit. The mathematics involved in calculating elk habitat effectiveness included consideration of open routes, closed routes, and the types of closures they were (e.g., gates or barriers), and whether they were open or closed during hunting season. These standards imposed significant restrictions on motorized routes forest wide based on different levels of required elk habitat effectiveness objectives (figure 38).The 100 percent and 75 percent elk habitat effectiveness objectives imposed limits of either no or very low amounts of motorized uses, whereas even in areas allocated for multiple uses for example, the elk habitat objective of 25 percent allowed more roads, but imposed a more permissive limit.

Many of the areas with objectives for high amounts of elk habitat effectiveness later became Idaho Roadless Rule areas when the Idaho Roadless Rule was established in 2008 as these areas were maintained without roads by the elk habitat effectiveness direction in the 1987 plans. Thus, the need for elk security measures in the Forest Plan has been reduced or eliminated because most of the areas protected by elk habitat effectiveness measures in the 1987 plans were subsequently designated as Idaho Roadless Rule Areas. Therefore, Idaho Roadless Rule area now protect many areas that were managed for elk security which replaced the need to management for elk habitat effectiveness in the Revised Forest Plan in those areas. For example, the acres and percentage of elk habitat effectiveness areas from the 1987 plans now designated as Idaho Roadless Rule areas are shown in the table below. Approximately 99.8 percent of areas that had a 1987 plan objective of 100 percent elk habitat effectiveness was either already in wilderness (32.3 percent) or became Idaho Roadless Rule areas (67.5 percent) for a total of about 1,562,770 acres (see table 85 and table 86 below). Similarly, approximately 84.36 percent of areas with a 1987 forest plan elk habitat effectiveness objective of 75 percent became Idaho Roadless Rule Area. Approximately 18.29 percent and 22.1 percent of areas with 1987 plan elk habitat effectiveness objectives of 25 percent and 50 percent respectively was later designated as Idaho Roadless Rule. Figure 38 shows the elk analysis units and their elk habitat effectiveness objectives. Note that the different objectives correspond to the different amounts of secure habitat presently existing. Therefore, the majority of areas that had objectives for elk habitat effectiveness in the 1987 plans were designated Idaho Roadless Rule areas or wilderness areas and are now protected against roads. Thus, because Idaho Roadless Rule areas restrict roads with only limited exceptions depending upon Roadless Rule Theme, and Wilderness Areas outright prohibit roads and motorized trails, there is no longer a need to manage for elk habitat effectiveness objectives in the Revised Forest Plan.

Table 85. The acres of area in the 1987 forest plans with 25%, 50%, 75% and 100% elk habitat effectiveness objectives. Note the acres within the Idaho Roadless Rule Areas

Elk Habitat Effectiveness Objective	Acres within Non-Roadless	Acres with Wilderness	Acres within Idaho Roadless Rule
Acres of area with 25% EHE	570,819	46	127,800
Acres of area with 50% EHE	379,521	241	107,125
Acres of Area with 75% EHE	95,699	223	516,362
Acres of Area with 100% EHE	1,686	262,457	548,516
Sum of Acres	1,047,725	262,967	1,299,803

Table 86. The percent of area with elk habitat objectives of 25%, 50%, 75%, and 100% within non-roadless, Designated Wilderness, and Idaho Roadless Rule areas. Note that high percentages of elk habitat objectives became Idaho Roadless Rule Areas

Elk Habitat Effectiveness Objective	Percent within Non-Roadless	Percent within Wilderness	Percent Within Idaho Roadless Rule
Percent of areas with a 25% Elk Habitat Effectiveness Objective	82.00%	0.01%	18.29%
Percent of Areas with a 50% Elk Habitat Effectiveness Objective	77.99%	0%	22.01%
Percent of areas with a 75% Elk Habitat Effectiveness Objective	15.64%	0%	84.36%
Percent of Areas with a 100% Elk Habitat Effectiveness Objective	0.21%	32.30%	67.50%

Note that minor spatial errors resulted from misalignment of elk habitat effectiveness layer boundaries with wilderness, non-roadless rule and Idaho Roadless Rule boundaries. This is why some percentages add up to slightly over 100%.

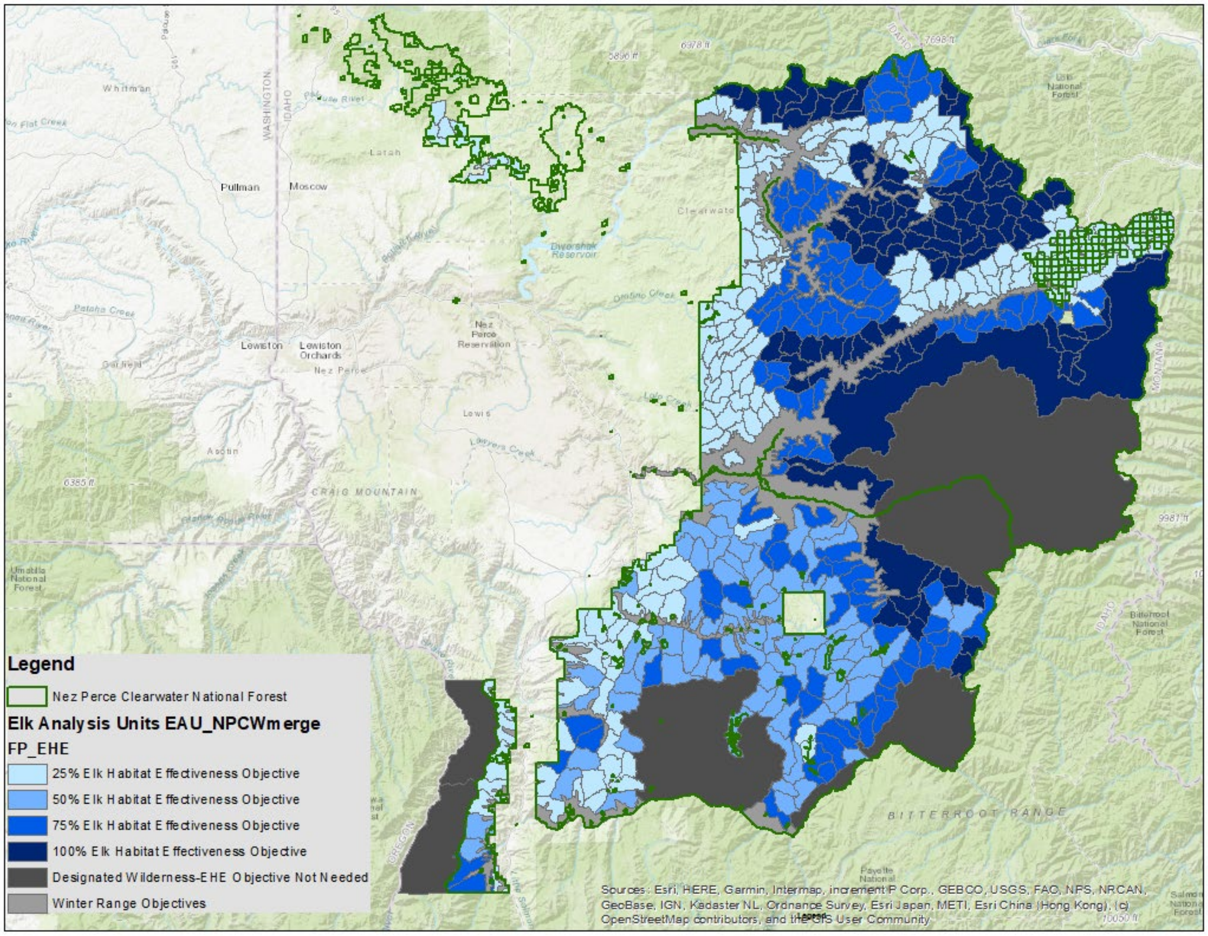


Figure 38. The elk habitat effectiveness objectives within elk analysis units from the 1987 forest plans.

Instead, the Revised Forest Plan would shift to plan components that emphasize integrating nutrition and evaluates the useability of that nutrition in relation to the displacement effects of roads. The Idaho Roadless Rule will also help provide secure areas for grizzly bears.

Management Areas in 1987 Plans

The revised forest plan will change the allocation of management areas and management area emphasis. The revised forest plan will simplify management into three management areas, each with unique management emphasis and they are further subdivided into sub-management areas.

Designated Wilderness

Of the 3,939,056 acres administered by the Nez Perce-Clearwater National Forests, there are approximately 1,139,059 acres of designated wilderness. These consist of three designated wilderness areas, two of which extend South across forest boundaries on to other National Forests. Congress has designated approximately 1,139,059 acres of wilderness within the plan area. These include the Gospel Hump, the Selway-Bitterroot, and Frank Church-River of No Return Wilderness areas. The Selway-Bitterroot and Frank Church-River of No Return Wilderness Area makes up the entirety of the Bitterroot Recovery Zone.

The Selway-Bitterroot Wilderness and the Frank Church-River of No Return Wilderness make up the core of the Recovery Zone for the federally listed threatened grizzly bear. These two wildernesses make up the largest contiguous blocks of federal land remaining in the United States and the largest block of wilderness in the Rocky Mountains. Reestablishment of grizzly bear in this recovery zone is currently through natural dispersal.

The Bitterroot Recovery Zone lies almost entirely within the Selway-Bitterroot Wilderness and the Frank Church-River of No Return Wilderness. The area known as the Bitterroot Ecosystem is centered around the federally designated Wilderness Areas of central Idaho, while a small portion extends eastward over the crest of the Bitterroot Mountains into Montana. It includes about 26,072 square miles of contiguous national forest lands in central Idaho and western Montana (50 C.F.R. § 17.84(l). These include portions of the Bitterroot, Boise, Salmon/Challis, Clearwater, Nez Perce, Payette, Sawtooth, and Panhandle National Forests in Idaho, and the Bitterroot and Lolo National Forests in western Montana. By contrast, the Bitterroot Recovery Zone (Servheen 1996) is approximately 3,731,733 acres (5,831 mi^2) in size and lies almost entirely within the Selway-Bitterroot Wilderness Area and the Frank Church-River of No Return Wilderness Area. The Bitterroot Ecosystem encompasses most of the Nez Perce-Clearwater National Forests (Servheen 1996). The Bitterroot Recovery Zone overlaps with the southeast side of the Nez Perce-Clearwater. On the Nez Perce-Clearwater, the Bitterroot Recovery Zone lies almost entirely within the Selway-Bitterroot Designated Wilderness and the Frank Church-River of No Return Wilderness, the only exception being the Magruder road. About 23.6 percent of the Nez Perce-Clearwater is included within the Bitterroot Ecosystem's grizzly bear Recovery Zone, also known as the Bitterroot Recovery Zone. The acres of Designated Wilderness Areas are shown in Table 19. Wilderness with acres on the Nez Perce-Clearwater.

Idaho Roadless Rule

Currently, the Idaho Roadless rule contributes to the ecological conditions to provide for grizzly bear connectivity and recovery. As described above, the Idaho Roadless Rule contributes to in the existing condition and ongoing actions that assist with protections for grizzly bears because the rule provides prohibitions with exceptions or conditioned permissions governing road construction, timber cutting, and discretionary mineral development (36 CFR Part 294 Federal Register/Vol. 73, No. 201). These activities have been known to affect grizzly bear habitat and the prohibitions contribute to grizzly bear conservation. The Nez Perce-Clearwater National Forests contains approximately 1,481,565 acres of Idaho Roadless Rule area within the five roadless rule area themes. The acres of each theme are shown in table 23, a map showing the distribution of these themes are shown in figure 5, and a summary of these prohibitions is included above in the Ongoing actions that Assist with protection of listed species section above. The current management of the Idaho Roadless Rule areas helps maintain grizzly bear habitats from the effects of the prohibited activities.

Factors that may affect grizzly bears not addressed by the Idaho Roadless Rule includes: the construction and use of motorized trails, livestock grazing, some fuels treatments, some vegetation treatments, road construction within community protection zones, extraction of saleable minerals, leasable minerals, geothermal development, energy corridors, or wind or biomass energy. Idaho Roadless rule areas also does not restrict primitive and semi-primitive recreation, address attractants, hunting or fishing activities, special use permits for outfitting and guiding, and there are some allowances for municipal water management. The plan will not change Idaho Roadless Rule Areas, Idaho Roadless Rule themes, nor associated prohibitions and allowances established by the rule. All recommended wilderness areas, as well as some Research Natural Areas, the Lolo Trail National Historic Landmark, and some Suitable Wild and Scenic Rivers in the proposed action are also Idaho Roadless Rule areas.

Recommended Wilderness

The 1987 Forest Plans recommended about 198,200 acres for wilderness, all within the boundaries of the Clearwater National Forest. More recent updated GIS data shows the area as about 197,693 acres. These areas are Hoodoo, Mallard Larkin, North Fork Spruce-White Sands and Sneakfoot Meadows. There were no wilderness recommendations in the Nez Perce National Forest Plan. The 1987 Clearwater National Forest plan standards for recommended wilderness state that the management standards for these areas will meet a visual quality objective of preservation and will manage all uses to maintain wilderness qualities and retain semi-primitive settings. Travel management in existing recommended wilderness areas was addressed in the Clearwater Travel Planning Record of Decision, dated October 31, 2017. Under this direction, areas that are currently managed as recommended wilderness prohibit mechanized transport, including mountain bicycles or game carts, and motorized use, including wheeled and motorized over-snow vehicles. Road construction, timber harvest, and mineral activities may only be allowed to the extent permitted in the Idaho Roadless Rule.

Table 87. The existing condition for the acres of recommended wilderness areas

Recommended Wilderness Area	1987 Forest Plan Acres	Updated GIS Acres
Hoodoo	113,000	111,988
Mallard-Larkins	66,700	66,377
North Fork Spruce-White Sand	9,800	9,865
Sneakfoot Meadows	8,700	9,465
Totals	198,200	197,695

Data Source: 1987 Forest Plans and updated Nez Perce-Clearwater GIS data. Note that in the 1987 Forest Plan Sneakfoot meadow, and Northfork Spruce-White sand were referred to as Storm Creek, Elk Summit, and Lakes.

These areas are also Idaho Roadless Rule Areas either under the Wildland Recreation theme or the Primitive theme and are currently managed to maintain their wilderness character. Management of recommended wilderness is similar to management for designated wilderness and Idaho Roadless Rule areas in the Wildland Recreation theme. These areas provide ecological conditions to contribute to recovery. Activities that are not prohibited in wilderness or roadless rule areas are also not prohibited in recommended wilderness.

Lolo Trail National Historic Landmark

The Lolo Trail, a National Historic Landmark administered in cooperation with the National Park Service, is part of the Nez Perce National Historical Park. It is managed with special direction that contributes to grizzly bear conservation. For example, it is designated and managed as Idaho Roadless Rule areas and in addition to maintain the integrity of the monument which includes some restrictions on new road construction, and vegetation treatments. The trail extends through the Nez Perce-Clearwater from Lolo, Montana, to Weippe, Idaho. The Lolo Trail National Historic Landmark was designated in 1963 and is composed of 55,760 acres and is located through the heart of the Clearwater National Forest. Its significance lies in its roots as an ancient American Indian trail and comprises the route Lewis and Clark traveled from 1805 to 1806, as well as the path of flight taken by the Nez Perce Indians during the Nez Perce Indian War of 1877. The landmark stretches about 62 miles from the Nez Perce-Clearwater boundary near Musselshell Meadows to the Nez Perce-Clearwater boundary near Lolo Pass. It is an area designated by Congress thus, the plan will not change the landmark boundaries, but it will provide special direction for its management and is analyzed below. Management emphasis of this area is to maintain the National Register integrity of the landmark as high and convey its exceptional value and qualities in illustrating the heritage of the United States.

Travel Management

Grizzly bears might encounter increased human presence and conflicts in areas with more roads. These conflicts often lead to bear deaths, and so are detrimental to individual grizzly bears. There are far fewer acres of secure habitat within Management Area 3, with most of them smaller than 1000 acres. These areas would not be biologically suitable nor socially acceptable for grizzly bear occupancy. A visual representation or map of the current travel situation is shown in figure 44 and figure 45 below.

The forest often uses temporary roads to implement projects such as timber or fuels treatments. These features temporarily impact localized areas during project implementation but are subsequently removed shortly after projects are completed. Thus, their effects are temporary and localized. It is possible that temporary routes used for vegetation management could affect polygons of secure habitat in the future temporarily. Most temporary roads tend to occur in proximity to existing motorized routes. Temporary roads are prohibited within designated wilderness areas and so are not allowed in the Bitterroot Recovery Zone. The Idaho Roadless Rule included a provision to allow roads existing before the establishment of the rule to remain and be maintained, but new roads are only allowed with limited exceptions as outlined in above the “Other Management Direction” section describing Idaho Roadless Rule direction table 23. For example, they are allowed within the Back Country Restoration areas only within Community Protection Zone areas to treat hazardous fuels. These are limited areas even within the backcountry restoration theme. Thus, temporary roads are mostly used within the managed front where multiple uses are emphasized, which are areas not biologically suitable nor socially acceptable for grizzly bears.

A private entity’s non-compliance with the Forest’s access management is an illegal activity. While illegal use of the Forest via motorized access in areas unauthorized for such use may occur within the action area, such illegal use is not considered a Forest action and therefore not analyzed under effects of the action, but their influence is considered for describing the environmental baseline.

While illegal motorized access has the potential to affect individual grizzly bears, the amount, location, duration, and timing of effects resulting from such illegal use is typically not known. Illegal motorized access is expected to be spatially disparate, temporary, and is not likely to collectively cause an adverse effect because most forest users follow travel regulations. When illegal use is observed or when user-created roads become apparent, the Forest corrects the situation as soon as they are able. Illegal use is in part, facilitated by the presence of authorized forest routes because they allow access from which illegal uses can start. Thus, the effects are considered here as part of the existing condition but are not quantified because of uncertainty in predicting where, when or how much it would occur. Most closed routes brush in quickly and are unusable because of the high productivity of vegetation growth on the Forests.

Airplane and Helicopter Use

Grizzly bears have been reported to be displaced by fixed wing aircraft and helicopter use (McLellan and Shackleton 1989b, McLellan and Shackleton 1989a). These studies used radio telemetry to evaluate response of grizzly bears to various human related disturbance activities and describe displacement of bears in response to recurrent helicopter and fixed wing aircraft uses. McLellan and Shackleton (1989b) describe displacement of grizzly bears from recuring flights in support of seismic activities. McLellan and Shackleton (1989a) showed displacement by grizzly bears in response to aircraft flights was farther when bears were in open habitat and the flight was less than 150m (164 yards) away. Thus, helicopter and fixed wing flights can displace grizzly bears, especially when they the flights are recurring or within close proximity.

The Forest Service does not have authority over whether aircraft can fly over National Forest Lands. Instead, the Forest Service has discretion and authority over whether aircraft interact with the ground such as when they land or take off from Forest Service lands, or when they drop or retrieve passengers or objects on national Forest Lands. Helicopters are used by the Forest Service and other agencies for emergency or administrative uses in some situations as explained below. The Nez Perce-Clearwater National Forests has some ongoing aircraft and helicopter use currently for administrative purposes and this activity will continue under the proposed action.

The Nez Perce-Clearwater National Forests has seven designated airstrips. Public airstrips on the Nez Perce-Clearwater are considered infrastructure and are a segment of the transportation system. The seven airstrips on the Nez Perce-Clearwater are available for public use and are located in the following locations: Cayuse at Cayuse Creek in the North Fork Clearwater drainage, Dixie at Dixie Guard Station, Fish Lake in the Lake Creek drainage of the Lochsa River, Moose Creek along the Selway River at Moose Creek Guard Station, Orogrande along Crooked River, Shear Airstrip along the Selway River at Shear Guard Station, and Wilson Bar along the Salmon River. The Fish Lake, Moose Creek, and Shear airstrips are located within the Selway-Bitterroot Wilderness and are managed as wilderness airstrips. Wilson Bar is managed as a Wild and Scenic River airstrip. Landing airplanes by the public can only happen at the designated airstrips and is not allowed otherwise. Helicopters used by the public may also land at the 7 designated airstrips.

The backcountry airstrips are valuable recreational infrastructure, and the 2012 Planning Rule requires consideration of air and recreational aviation uses. Members of the public may use the public backcountry airstrips without restrictions and this ongoing use will continue after the revised forest plan is finalized. Thus, they can be used by anyone including FS admin use, state agencies like IDFG, private planes or air transport shuttle companies. Under the existing condition, the airstrip at Moose Creek in the Selway Bitterroot Wilderness is limited to 800 visitors annually, which was established by the Selway Bitterroot Wilderness Plan, though the limit has not been reached in any year. The Nez Perce-Clearwater National Forests have not tracked airstrip use beyond monitoring the number landings at the Moose Creek airstrip. While use has been considered low the use is growing with private plane landings. Airstrips encompass a relatively small footprint compared to roads and trails, usually around 2500 feet by 75 feet. They are usually located in a relatively flat natural meadow. Backcountry airstrips are often maintained by pilot communities through the Forest Services' Volunteer program.

The Central Idaho Wilderness Act allowed continued use of backcountry airstrips and landing of aircraft within the Selway-Bitterroot and Frank Church River of No Return Wilderness as follows:

> *"the landing of aircraft, where this use has become established prior to the date of enactment of this Act shall be permitted to continue subject to such restrictions as the Secretary deems desirable: Provided, That the Secretary shall not permanently close or render unserviceable any aircraft landing strip in regular use on national forest lands on the date of enactment of this Act for reasons other than extreme danger to aircraft, and in any case not without the express written concurrence of the agency of the State of Idaho charged with evaluating the safety of backcountry airstrips landing of aircraft within a designated unit."*

With the exception of backcountry airstrips, landing aircraft in designated wilderness areas is prohibited by the Wilderness Act. Use of these backcountry airstrips is retained in the revised forest plan consistent with the Central Idaho Wilderness Act.

Helicopters and fixed wing aircraft are commonly used in firefighting activities, and prescribed burning. Aircraft and helicopter use associated with firefighting include surveillance, reconnaissance of new fires, to moving people to or away from fires, and to drop fire suppressing agents such as water or fire retardant. Helicopter and aircraft use during suppression activities do not require prior authorization.

During prescribed burning activities, helicopter and aircraft are used to ignite, monitor, and to maintain control of prescribed fire. These types of projects are authorized after a site-specific environmental analysis including Endangered Species Act consultation.

There have been some cases where requests have been made to allow landings in wilderness for scientific and research purposes and by State Wildlife Agencies. A minimum requirements analysis is required by law whenever land managers are considering a use prohibited by Section 4(c) of the Wilderness Act of 1964. These have been evaluated and authorized on a case-by-case basis after site specific analysis.

The Idaho Department of Fish and Game uses helicopters and fixed wing aircraft in their wildlife management and research activities. Wildlife management activities include areal wildlife surveys and sometimes use helicopters in the capture, radio collaring, relocation, or reduction of animals. Future activities related to aircraft use could also include research or monitoring of grizzly bears. These activities sometimes require landing helicopters or aircraft on national forest lands. They generally require coordination with the Forest Service in these activities outside of wilderness and require authorization within wilderness.

Some vegetation management is conducted through aerial harvest systems, utilizing helicopters. Aerial harvest is often desirable to avoid unacceptable resource damage such as the creation of new roads or to access timber not otherwise accessible. However, aerial methods of harvest are more expensive than other harvest types. Harvest using aerial methods are a relatively common practice on the Nez Perce-Clearwater National Forests. Like other actions, projects proposing aerial harvest systems for vegetation management are evaluated and authorized on a case-by-case basis as part of a project NEPA analysis and also undergo Endangered Species Act consultation.

Forests in other areas have had helicopters used in seismic exploration for oil and gas minerals. This type of exploration is not likely to occur on this forest because the area is considered to have low potential for oil and gas. These types of projects are required to undergo site specific environmental analysis and Endangered Species Act consultation as well prior to authorization.

The Revised Forest Plan will not make any decisions to authorize, nor close, aircraft use and does not make decisions to authorize nor close backcountry airstrips. Instead, the Proposed Action will provide plan components to guide future authorization of aircraft and helicopter use. Decisions on the establishment, maintenance, reauthorization or closing of backcountry airstrips, would require site specific environmental analysis and consultation and must comply with the forest plan. Plan direction governing aircraft use and the effects of that plan direction are described below in the effects to the "Effects of Airplane and Helicopter Use" section.

Winter Motorized Use

For winter motorized travel, the 1987 forest plan winter recreation opportunity spectrum allows winter motorized travel in semi-primitive motorized, roaded natural, and rural. They are not suitable, and thus not allowed in primitive and semi-primitive non-motorized settings. Non-motorized settings are generally located in designated wilderness and recommended wilderness. Even though motorized settings may be suitable for over snow motorized uses, they require travel planning to open or close areas to winter motorized uses, which would require a site-specific analysis and Endangered Species Act consultation.

Table 88. The percent of the plan area within the different winter recreation opportunity spectrum settings

Winter Recreation Opportunity Spectrum	Existing Condition
Primitive	25
Semi-primitive non-motorized	36
Semi-primitive motorized	16
Roaded natural	23
Rural	0

Currently, motorized over snow recreation is allowed nearly forest wide except in recommended wilderness areas and wilderness areas. Prior to the Clearwater Travel Plan Decision, recommended wilderness areas were open to over snow motorized travel. The Clearwater Travel Plan closed recommended wilderness areas to over snow motorized recreation.

Recreation Sites

There are several developed and dispersed recreation sites on the Nez Perce-Clearwater National Forests, some of which grizzly bears may travel through the forest in route to the Bitterroot Recovery Zone. Of particular note are the campgrounds along the North Fork of the Clearwater, and the Lochsa corridor. The plan area hosts 55 developed campgrounds, 53 dispersed camping facilities, 12 picnic sites, 16 lookouts or cabins, and 40 trailhead facilities. There are 121 miles of motorcycle trails, 1018 miles of trails for vehicles less than 50," and 63 miles of trails for vehicles larger than 50." There are a total of 15 miles of bike trails, 3,211 miles of pack trails, and 15 miles of hiking only trails. The number of non-developed dispersed overnight sites total 1241, and the number of dispersed trailheads total 109. The majority of recreation use on the Nez Perce-Clearwater occurs in primitive dispersed sites rather than developed facilities. These recreation sites might attract grizzly bears and are potential sites for conflict. The Forest does not yet have a food storage order in place and lacks facilities to provide the public with bear safe storage. Many campgrounds need upgrades to refuse storage or new bear resistant dumpsters. Most developed sites are located within Management area 3. To this point, there has not been an incident at a recreation site of a grizzly bear-human conflict. The forest service often posts signs to educate the public at recreation facilities recommending bear safety measures.

In the event that grizzly bears become established, a number of actions would be conducted by the Forest Service in partnership with the Interagency Grizzly Bear Subcommitee for the Bitterroot Ecosystem along with the Idaho Department of Fish and Game, the Nez Perce Tribe, and the U.S. Fish and Wildlife Service among others to take an adaptive approach to respond to the presence of grizzly bears. Among possible actions include a special forest order implementing a food storage order, installation of infrastructure for bear safety, a public outreach and education program, and coordination on bear-human conflict interventions as appropriate.

Northern Rockies Lynx Management Direction

The Northern Rockies Lynx Management Direction (NRLMD) is a forest plan amendment that amended 18 Forest Plans across the Western United State for the conservation of the Federally Listed Threatened Canada Lynx. On March 23, 2007, the U. S. Fish and Wildlife Service issued a biological opinion and incidental take statement on the effects of the Northern Rockies Lynx Management Direction (NRLMD) on the Distinct Population Segment of Canada lynx (lynx) in the contiguous United States (U.S. Department of Agriculture 2007d), in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The NRLMD provides direction primarily for lynx habitat management to avoid or reduce the potential for projects proposed under Forest Plans to adversely affect lynx. The NRLMD indirectly conserves habitat for grizzly bear by promoting and conserving the habitat conditions needed to produce snowshoe hare (lynx primary prey) densities that are adequate to sustain lynx within their home ranges, and thus sustain lynx populations and promote recovery of Canada lynx. Snowshoe hare habitat includes forested areas with multi-story characteristics which may provide cover for grizzly bears and restrictions on alteration of multi-story snowshoe hare habitat within the NRLMD constrains management of forests with these features. Implementation of the NRLMD will continue as planned under the revised forest plan via a plan standard which incorporates the Northern Rocky Mountain Lynx Direction (NRLMD) into the plan in its entirety.

Secure Habitat

Secure habitat is a key indicator for this analysis. As discussed above, this analysis adopted the definition of secure habitat from the Greater Yellowstone Ecosystem. We combined the road and motorized trails datasets into one dataset of motorized route, meaning both road and motorized trails. From that dataset, we then identified any motorized routes as "open motorized routes," that were either open, open seasonally, or open to administrative uses but closed to the public. Any roads or motorized trails that were closed permanently to all users were not included. We used ArcGIS to buffer any open motorized routes by a distance of 500 m (0.31 miles), then included areas outside of that buffer as secure habitat. In other words, we identified secure habitat as any lands outside of the 0.31-mile buffer distance from an open motorized route. While every attempt was made to include all road and trail features and accurately represent them, some inaccuracies or accidental omissions are possible in the data. This analysis did not include calculations or buffers of roads outside of Forest Service Lands nor did we buffer the Forest Service Boundary in the calculation of secure habitats. Thus, some areas of secure habitat may be impacted by roads and trails outside forest service lands. However, figure 55 in the cumulative effects section below shows that the Nez Perce-Clearwater National Forests is surrounded on three sides by other Forest Service lands. Lands along the western boundary are composed of a mix of private, state, tribal and industrial forest lands. However, there is little secure habitat on the Forest's western boundary because of existing forest roads. Thus, only limited amounts of secure habitat are impacted by roads outside of Forest Lands.

For the Greater Yellowstone Ecosystem, secure habitat has been defined as any contiguous area >4.05 ha (10 acres) that is >0.31 miles (or 500 m) from an open or gated motorized access route (road or trail) or recurring low level helicopter line during the non-denning period of March 1 – November 30 (Interagency Grizzly Bear Committee 1998 (Interagency Grizzly Bear Committee 1998, Interagency Conservation Strategy Team 2007). CFR 50 part 17 indicates that this size was selected for the Greater Yellowstone Ecosystem because the Interagency Grizzly Bear Study Team and Yellowstone Ecosystem Subcommittee concluded that all secure habitats are important for grizzly bears, regardless of size, particularly in peripheral areas. There is no scientifically based minimum secure habitat size based on statistically repeatable use-availability analysis for reproductive females for any of the currently occupied recovery zones. No current research on grizzly bear habitat use exists for the Bitterroot Ecosystem to inform a minimum size patch of secure habitat. While larger, less fragmented patches of secure habitat are likely better for a grizzly bear, even a small patch of secure habitat may afford a grizzly bear a valuable space to avoid the effects of motorized routes and to move through or find valuable habitat in the area, and thus may be important for connectivity. This is the definition that was adopted for use in this analysis, though unlike in the Greater Yellowstone Ecosystem, there are no associated requirements in the plan associated with this definition because there are no resident bears in the Bitterroot Recovery Zone. Its use is only for analysis purposes and was selected because secure habitats of any size probably contribute to grizzly bear ecology. However, recognizing that larger secure areas probably have more value to grizzly bears, we report the amount of secure habitat larger than 1,280 acres consistent with findings of Wakkinen and Kasworm (1997) that suggested that areas this size and larger were used more by grizzly bears than smaller blocks.

Secure habitat was evaluated spatially by identifying how much secure habitat would overlap with the land allocations and the suitability of various uses. Land allocations and their associated suitability of uses dictate where future activities have the potential to impact ecological conditions for grizzly bears. Where impactful activities are suitable, there is a higher potential for impacts. However, where activities are not suitable, there is low or no potential for impacts from those activities. Therefore, the land allocations explicitly control future potential impacts. For example, the amount of secure habitat that could potentially be affected by motorized uses are dictated by the distribution of lands where that activity is suitable. The potential future impact of timber activities, and associated roads, are dictated by the lands where that activity is suitability. There is virtually no potential for impact from timber or motorized uses within lands where that activity is not suitable. Even if an activity is suitable, it only means that this activity has potential to occur but does not mean that it will occur, even where it is suitable. Land allocations and their associated suitability affect potential future impacts to secure habitat include Management Area allocation, Designated wilderness, recommended wilderness, Idaho Roadless Rule areas, Recreation Opportunity Spectrum (ROS) settings, timber suitability, designated wild and scenic rivers, eligible and suitable wild and scenic rivers, the National Historic Landmark, and research natural areas. Each of these land allocations find various uses either suitable or not suitable to various extents, and thus dictate whether there is potential or no potential for effects from each activity. The suitability for each land allocation and the suitability of different activities are discussed in various sections below. While these delineations don't affect grizzly bears directly, they would dictate the broad direction in the plan that would apply to these areas and the types of activities allowed or disallowed. Land allocations and suitability's could lead to either potential for future impacts in some cases or protections for grizzly bears in other cases. While activities that could affect grizzly bear habitat could occur in suitable areas, where, when, or how much of these activities is not yet known. In the event future activities are proposed under the plan, there would be a site-specific analysis, decision, and consultation with the U.S. Fish and Wildlife Service before implementation. The effects of these suitability plan components are analyzed below by evaluating the total area where these activities are suitable and describing the amounts of secure habitat that overlaps lands where various activities are either suitable or not in the plan based on land allocations.

Secure habitats were calculated by buffering all roads and motorized trails by 500 meters open to the public or closed to the public but open to administrative uses, and then included any areas that were within the Forest service control, but outside of the road and motorize trail buffer as secure habitat. Secure habitats were then analyzed as to how they overlap spatially with the proposed action in the revised forest plan. The amount of secure habitat within various decisions in the plan were calculated using ArcGIS. Examples included the amounts and percentages of secure habitat within recommended wilderness, recreation opportunity spectrum, timber suitability, and the Management Areas. ArcGIS was used to calculate these amounts by using the identity tool in that software, repairing geometry, and then calculating acres.

We used the best available data when calculating secure habitat. They include the road data and the motorized trail data. To calculate secure habitat, we updated our spatial road and motorized trails data with all the known closures and added any routes that were known. Updating the motorized route data was a process that took approximately 6 months of full time GIS work to complete. This included updating any closures, road status, alignment, or other known discrepancies in the data. However, despite this extensive effort, it's still probable that there are cases where the road or motorized trail alignment is different on the ground than in the data. In some cases, some segments of road or motorized trail may extend farther on the ground than is represented in the data. There may be some user created features that are used by the public that are not reflected in the data. In some cases, these are unauthorized or illegal uses of motorized vehicles. Illegal uses are corrected on the ground as soon as they are known via signs or physical barriers. It should be noted that we believe that, despite the discrepancies, the methods used here in this analysis underestimates the amount of secure habitat on the ground because many of the administrative roads are in storage to be used at a future date but are not actually drivable currently. Maintenance of motorized road and trail data is an ongoing activity of the Forest Service and is continually updated to be as accurate as possible. Correcting the data to fix all errors would take a lot of time ground truthing and editing the data. It should be expected that the data will continue to be updated in the future to address any discrepancies and accurately reflect the amount of secure habitat. Additionally, the second tier of this programmatic consultation framework would provide us an opportunity to continue to update in the future via site specific consultations where appropriate.

In total there is about 2,463,079 acres of secure habitat larger than 10 acres, with the majority of it within the Idaho Roadless Rule areas, wilderness areas and recommended wilderness areas. The Forest wide total acres of secure habitat make up about 63 percent of the forests land base with about 37 percent not secure. Areas of secure habitat range in size from contiguous blocks of approximately 10 acres up to 1,103,922 acres, with the largest block centered in the Selway Bitterroot Wilderness area. There are 12 blocks of secure habitat that are larger than 5,000 acres but smaller than 10,000 acres, and 26 that have greater than 10,000 acres each. Some of these larger blocks of secure habitat encompass several HUC 10's. The largest blocks of secure habitat are within designated wilderness and recommended wilderness. Most of the larger sized blocks outside of Designated wilderness are within Idaho Roadless Rule Areas within the Clearwater National Forest. The plan area contains 84 blocks and a total of 2,380,232 acres of secure habitat larger than 1,280 acres reported to compare to findings from Wakkinen and Kasworm (1997) that suggested grizzly bears preferred secure habitats this size and larger. Thus, 96.6 percent of secure habitat in the plan area are in blocks larger than 1,280 acres.

It should be noted that in our calculation of secure habitat, we excluded areas as secure habitat where we have roads closed to the public but open to administrative uses. Admin roads were included in the secure habitat buffer analysis and therefore excluded from the calculation of secure habitat, on the ground they could in fact be secure habitats for grizzly bears. We excluded these features from secure habitat to account for any potential effects from these features but in reality, the on-the-ground situation is that these roads are probably not usable in many cases. Roads closed to the public but open to administrative uses are in what are termed basic custodial care and are not typically drivable because vegetation grows on them, the culverts are pulled, and they often have barriers that prevent use. They are retained as roads in the databases so that future timber management could be performed without having to reconstruct road prisms in the event they are needed for future uses. The spatial data the Forest has for these features does not have information about their usability, nor whether they are being used by the public, so they were buffered and excluded as secure habitat as a precaution. Calculations without administrative roads counting against secure habitat results in an estimate of secure habitat of 2,721,604 or about an additional 258,525 acres more of secure habitat compared to estimates where administrative roads are accounted. In all analysis below, areas with administrative roads were excluded as secure habitat.

It should be noted that many roads on the Nez Perce-Clearwater National Forest are open only part of the year and closed seasonally to reduce elk vulnerability during fall hunting season. Many roads are closed to motorized travel at the start of hunting seasons or at various times in the fall and remain closed until spring. They are typically gated, and the gates are closed and locked in the fall or late summer on specified dates. When calculating secure habitat, we considered roads as not secure if they were open to motorized uses at any time of the year and did not account for roads that are closed seasonally. In reality, seasonal closures potentially increase the amount of secure habitat at least temporarily.

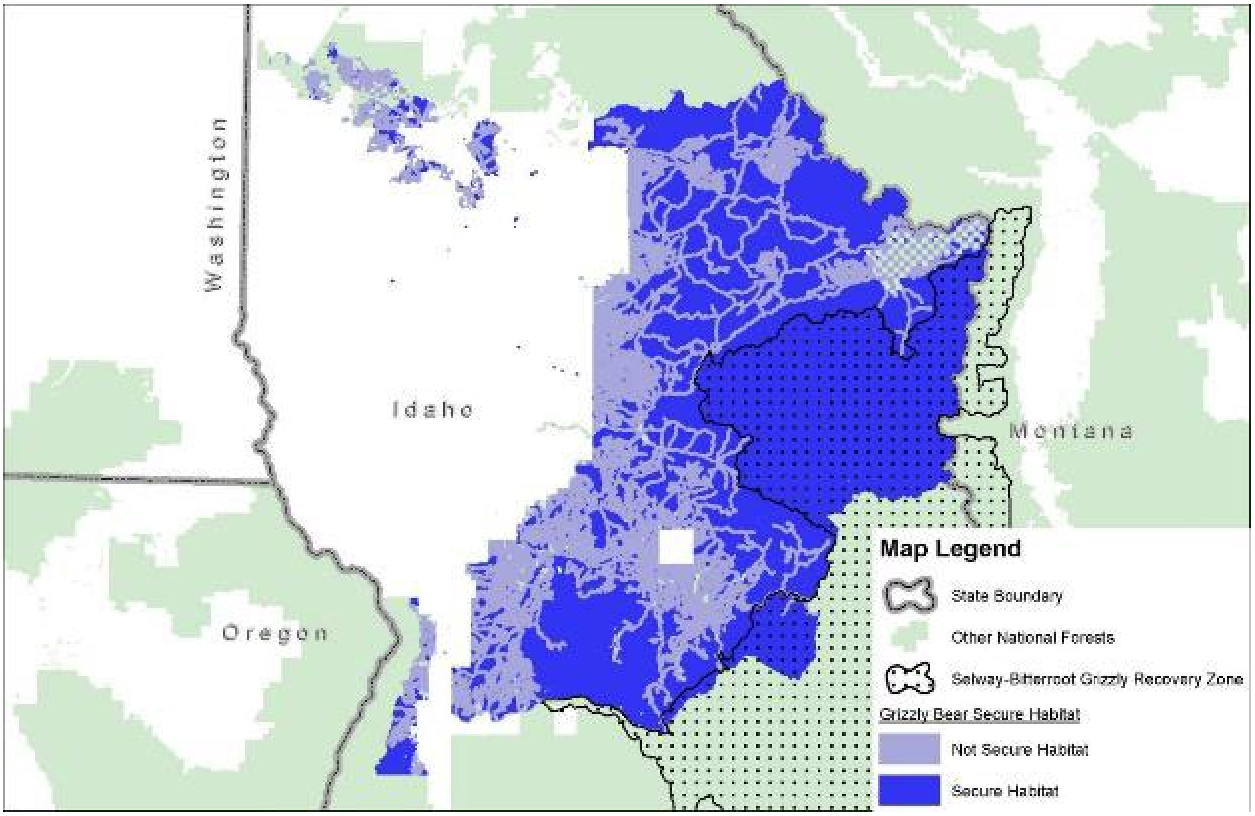


Figure 39. Secure habitat on the Nez Perce-Clearwater National Forests shown in dark blue, while areas in light blue are not secure due to roads or motorized trails open to the public and roads closed to the public but open for administrative use

The scale and units at which to evaluate secure habitat was carefully considered. Watersheds were used as the unit because these provide a consistent unit delineated by landscape features and are used broadly in natural resource management by many natural resource disciplines. They form discrete units that must fall within a range of sizes. The plan used HUC 10 or 5th code watersheds as the scale at which to evaluate secure habitat because this is the size of watershed most consistent with the size of female home ranges. HUC 12 or 6th level HUCs range in size from 10,000 acres to 40,000 acres and are too small generally to replicate female home range sizes. HUC 10 watersheds range in size between 40,000 to 250,000 Acres (62 to 390 mi²). In comparison, as described above average female home ranges range from 30,720 to 101,760 acres (48 to 159 square miles) (Aune and Kasworm 1989b, Blanchard and Knight 1991, Mace and Waller 1997, Mace and Roberts 2011, Kasworm et al. 2021, Kasworm et al. 2022).

The amount and percent of secure habitat within HUC 10 (5th level) watersheds is shown in table 89. HUC10's range from 40,000-250,000 acres so they overlap the range of female home range in size. However, the calculations in table 89 only included portions of the watersheds within the forest boundaries, therefore some watersheds are only partially in the plan area, so some of them may be smaller than a female home range (table 89). The data in the table below only reflects the area and percent of secure habitat within watersheds and within the Forest Planning Area. Six watersheds that extend outside of the plan area boundaries fall within adjacent forest service lands. Assuming that a minimum female home range is 32,000 acres, 47 out of 63 or 74.6 percent of HUC 10 watersheds have enough secure habitat inside the planning area to provide for at least one female home range.

Table 89. The amount and percent of secure habitat within HUC 10 (5th level) Watersheds. The calculation only includes lands administered by the Nez Perce-Clearwater National Forests

Watershed Name	Total Watershed Acres in Plan Area	Acres Secure Habitat	Percent Secure Habitat
American River	40,795	8,992	22%
Bargamin Creek	69,941	60,925	87%
Bear Creek	114,866	114,866	100%
Beaver Creek-North Fork Clearwater River*	41,938	25,157	60%
Big Bear Creek*	3,895	357	9%
Big Mallard Creek-Salmon River*	98,569	74,994	76%
Big Squaw Creek-Salmon River*	15,402	15,402	100%
Breakfast Creek*	466	14	3%
Cayuse Creek	107,918	74,172	69%
Clear Creek*	42,847	9,603	22%
Colt Killed Creek	155,773	138,183	89%
Crooked Creek	82,989	62,059	75%
Crooked Fork Creek	77,252	37,421	48%
Crooked River	44,282	13,359	30%
Deep Creek-Palouse River*	53,381	2,943	6%
Dicks Creek-North Fork Clearwater River*	130	130	100%
Elk Creek*	36,363	9,531	26%
Fish Creek	56,332	41,744	74%
Fourth of July Creek-North Fork Clearwater River	84,007	55,321	66%
Gedney Creek-Selway River	137,344	73,917	54%
Johns Creek	71,389	59,287	83%
Kelly Creek	87,313	76,519	88%
Lake Creek-North Fork Clearwater River	128,632	80,412	63%
Lolo Creek*	79,134	6,327	8%
Lower Clearwater River	159	101	64%
Lower Little North Fork Clearwater River*	10,039	6,784	68%
Lower Little Salmon River*	11,177	2,947	26%
Lower Lochsa River	147,547	89,633	61%
Lower South Fork Clearwater River*	3,110	95	3%
Meadow Creek	155,336	112,744	73%
Middle Fork Clearwater River*	25,405	8,628	34%
Middle Lochsa River	169,173	139,355	82%
Middle Potlatch River	16,681	3,253	20%
Middle South Fork Clearwater River	82,618	12,056	15%
Moose Creek	279,754	262,280	94%
Newsome Creek	42,303	8,653	20%
Orofino Creek*	10,822	101	1%
Orogrande Creek*	38,845	4,532	12%
Partridge Creek-Salmon River*	39,951	11,389	29%
Pettibone Creek-Selway River*	89,597	89,597	100%
Pine Creek*	66	8	13%

Watershed Name	Total Watershed Acres in Plan Area	Acres Secure Habitat	Percent Secure Habitat
Quartz Creek-North Fork Clearwater River	48,312	22,041	46%
Race Creek-Salmon River*	43,893	7,313	17%
Rapid River*	27,897	19,956	72%
Red River	99,424	15,032	15%
Running Creek*	36,779	30,896	84%
Sabe Creek*	21,925	21,072	96%
Sheep Creek-Salmon River*	78,769	73,956	94%
Silver Creek-North Fork Clearwater River*	821	717	87%
Skookumchuck Creek-Salmon River*	22,746	3,212	14%
Skull Creek	55,924	46,088	82%
Slate Creek	78,166	24,698	32%
Three Links Creek-Selway River	129,984	127,286	98%
Upper Clearwater River	9	0	<1%
Upper Hangman Creek*	2,253	317	14%
Upper Lochsa River	64,209	28,307	44%
Upper Potlatch River	29,418	9,249	31%
Upper South Fork Clearwater River	131,857	52,384	40%
Warm Springs Creek	45,800	45,625	100%
Washington Creek-North Fork Clearwater River*	50,646	20,171	40%
Weitas Creek	139,873	88,774	63%
White Bird Creek*	35,571	4,088	11%
Wind River	41,242	28,104	68%
Grand Total	3,939,056	2,463,079	63%

*Indicates the HUC 10 watershed extends outside of the planning area

Figure 40 shows a visual representation of the percent of secure habitat within each watershed. The watersheds are colored to show secure habitat amount of between 0-25 percent secure habitat, 25-50 percent secure habitat, 50-75 percent secure habitat, and 75-100 percent secure habitat. It is assumed that higher percentages of secure habitat would provide for better connectivity for dispersing bears.

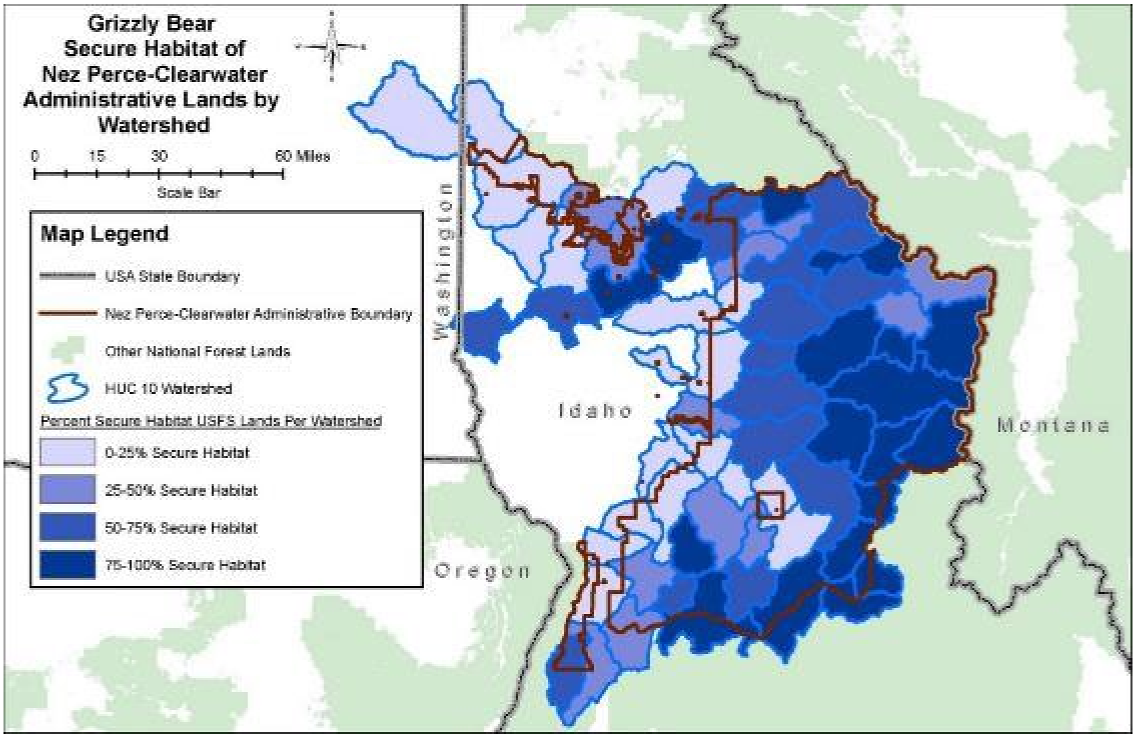


Figure 40.The amount of secure habitat by HUC 10 watershed broken out into four categories by percentage of secure habitat within the watershed. Categories include watersheds with between 0-25 percent secure habitat, 25-50 percent secure habitat, 50-75 percent secure habitat, and 75-100 percent secure habitat

Connectivity

Habitat connectivity is widely recognized as a crucial component for maintaining plant and animal diversity and managing for sustainable populations of native species (Western Governor's Association 2008, Hansen 2009, McIntyre and Ellis 2011, Cushman and Landguth 2012, Parks et al. 2012, Haber and Nelson 2015, Wade et al. 2015, McClure et al. 2016). There are two primary requirements for habitat connectivity. The first is that suitable habitats are present for species of interest, and the second is that landscapes are permeable to wildlife movement. Long-range dispersal movements may contribute to gene flow between populations, genetic rescue of small or isolated populations, and colonization of new areas (Parks et al. 2012). Habitat connectivity is crucial to the establishment of grizzly bears in the Bitterroot Recovery Zone and could contribute to genetic interchange and demographic support between occupied grizzly bear recovery zones.

The Species Status Assessment (U.S. Department of the Interior 2021c) states that connectivity is important to grizzly bear recovery and identified connectivity as an important demographic need and one of the six demographic factors important to resiliency. It identifies two types of connectivity important grizzly bear populations in the recovery zones, demographic, and genetic connectivity. For genetic connectivity, long distance dispersal by males enables immigrants to act as a counter to genetic fragmentation and loss of nuclear genetic diversity for example within the GYE. Male and female movements within and between ecosystems can enhance genetic diversity and reduce genetic fragmentation. Females tend to be the focus of demographic connectivity because they are necessary for reproduction. Female dispersal is gradual (McLellan and Hovey 2001b), usually significantly shorter than males (McLellan and Hovey 2001b, Proctor et al. 2004), and holds the potential for small population augmentation and/or demographic rescue through their ability to bear offspring post-immigration into small isolated populations. Female grizzly bear dispersal patterns suggest that to enhance or re-establish female connectivity, female occupancy of linkage areas is necessary to facilitate inter-generational connectivity (U.S. Department of the Interior 2021a).

Efforts have been made to evaluate and model grizzly bear connectivity across the different ecosystems in the Lower 48 states and Canada(Craighead and Olenicki 2005), (Walker and Craighead 1997, Servheen et al. 2003a, Proctor et al. 2012, Proctor et al. 2015, Peck et al. 2017). While their methods to model habitat connectivity differed, these studies all identified roads or human developments as factors that affect connectivity. Highways in particular have been identified as restraints to grizzly bear dispersal (Servheen et al. 2003b, Proctor et al. 2005, Proctor et al. 2015, Peck et al. 2017, Kasworm et al. 2021). Features related to connectivity appear to be related to highways and developments outside of the Nez Perce-Clearwater National Forest.

The most significant barriers to connectivity are outside the planning area and include the I-90 corridor, Montana Highway 200, and Montana Highway 93 and associated human development. I-90 appears to be a barrier between the Bitterroot Ecosystem and the NCDE, the CY, and Selkirk ecosystems. Servheen (2003b) predicted several linkage areas through these developed areas into the Bitterroot Ecosystem. Passage of bears through these linkage areas may dictate where bears enter the Nez Perce-Clearwater and the Bitterroot Ecosystem to some extent.

Most fragmentation between the Northern Continental Divide and Bitterroot Ecosystems occurs along the I-90 corridor between Missoula, Montana, and Superior, Montana, and along U.S. Highway 93 North of Missoula from Evaro Hill to Ravalli Hill. Missoula is a rapidly growing city and suburban development has been rapidly spreading west and north along these major highway corridors. Some connectivity areas were available between Alberton, Montana, and Superior, Montana; between Superior, Montana, and St. Regis, Montana; and northwest of St. Regis (Servheen et al. 2003b). Bears traveling through these linkage areas would most likely enter the Nez Perce-Clearwater through the Hoodoo or Mallard Larkin areas. The area between Lolo, Montana, and Lolo Hot Springs along U.S. Highway 12 is well connected. Bears traveling through this area would have little trouble passing into the plan area and would do so near Lolo Pass.

Servheen (2003b) did not evaluate connectivity south of Lolo, Montana. The spread of the Northern Continental Divide Ecosystem population southward may enable this area to serve as a path through which bears may disperse. Bears dispersing through this area would also face significant barriers through Highway 93 and associated development into the Bitterroot Ecosystem area. However, if they made it through these areas, bears would have would enter into the Bitterroot National Forest and have passage into and through the Nez Perce-Clearwater National Forests to the Bitterroot Recovery Zone.

Large portions of the plan area appear to be well connected currently (figure 41). For example, if it is assumed that large areas with high amounts of secure habitat in proximity to each other are used more by grizzly bears, and would facilitate grizzly bear dispersal, then areas with these characteristics would facilitate connectivity. Based on these assumptions, figure 41 below visually displays secure habitats >1,280 acres as the basis for potential pathways of secure habitat through the Nez Perce Clearwater, wherein a grizzly bear could disperse through the Bitterroot Recovery Zone under existing conditions. This is of course assuming that lands without roads (secure habitat) would provide more permeable habitat to provide potential passage of grizzly bears. Keep in mind also that grizzly bears can also pass through non-secure habitat as has been documented here with Bear 927 passing through the area with checkerboard ownership near Lolo pass, which has higher road densities.

Some of these areas were identified in the proposed action as non-motorized, in part to provide connectivity for grizzly bears. Areas identified as non-motorized for grizzly bear connectivity are displayed in figure 41 below in the Recreation Opportunity Spectrum Setting section.

All federally managed lands generally provide protection from permanent residential and urban development. Grizzly bears may be able to pass through Forest Service lands in areas with higher road densities as well because roads are typically back country roads with lower traffic volumes and lower travel speeds. While back country roads perhaps are not as good for bears as un-roaded areas, they are likely more permeable than highways. Bear 927 for example, crossed through and spent time within the Lolo pass checkerboard area on his way to the Bitterroot Recovery Zone. The Grizzly Bear Recovery Program 2020 Annual Report showed a map of bear 927's path and areas of use, which showed use of the Lolo Pass and nearby checkerboard ownership area. Grizzly bear 927 also passed between these areas, which have higher road densities and less secure habitat but perhaps is still relatively permeable.

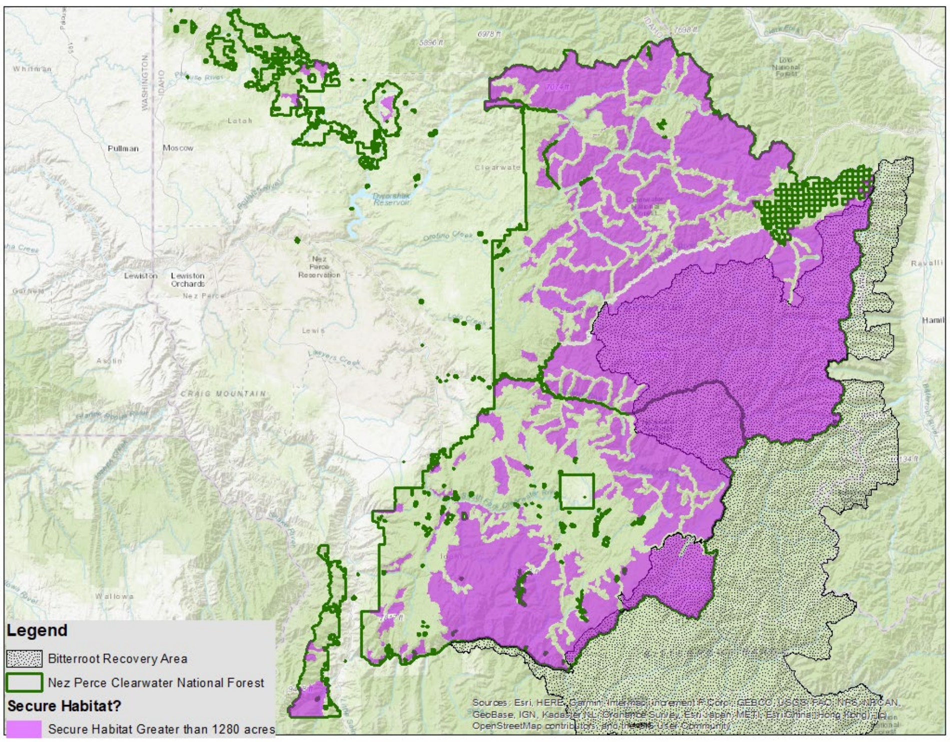


Figure 41. Secure habitat greater than 1280 acres in size shown in purple that hypothetically provide permeable habitat that could provide for potential connectivity for grizzly bears. This graphic provides a rough visual representation of relative connectivity into the Bitterroot Recovery Zone based on the assumption that secure habitats larger than 1280 acres in proximity would facilitate grizzly bear use and dispersal.

Some areas of multiple use management may be important for connectivity because of their location. Some are located where grizzly bears have a higher likelihood of encountering on their way into the Bitterroot Recovery Zone. Specific examples include the checkerboard ownership areas near Lolo Pass, and two areas of Management Area 3 in the Kelly Creek Area in the North Fork Clearwater Area (figure 41). Dispersing bears entering the forest from the North or East could encounter these areas. These areas have existing conditions that could potentially lead to human-bear conflicts because of higher road density and more human uses. Bear 927 used the checkerboard area near Lolo pass (i.e., mixed private and Forest Service landownership in a checkerboard pattern) and passed through the secure habitat between the multiple use areas near Kelly Creek. The grizzly in 2007 was accidentally killed near the

Kelly Creek area. It is possible that grizzly bears could navigate around or through these areas when establishing new home ranges or passing through as bear 927 did.

Rangeland Management and Grazing

Grazing allotments generally occur in areas of low amounts of secure habitat. They are arranged away from areas where grizzly bears might be expected to cross the forest and away from the Bitterroot Recovery Zone. Only one vacant cattle allotment overlaps with approximately 380 acres of the Frank Church-River of No Return Wilderness area. No new grazing allotments would occur within the Selway Bitterroot and Frank Church River of No Return Wilderness because language in the Central Idaho Wilderness Act only allotments in place before 1980 would be allowed to continue (Central Idaho Wilderness Act 1980). While livestock grazing on the forest is distributed mostly outside of the recovery zone, there are livestock allotments currently operating on the forest where grizzly bears may possibly find them simply because grizzly bears are such wide ranging animals that it’s not discountable that they would probably encounter livestock at some point. If a grizzly bear were to encounter livestock, there could be livestock loss which might lead to human bear conflict. Such conflicts between grizzly bears and domestic livestock can result in the capture, relocation, injury, or removal of grizzly bears. The revised forest plan will not authorize nor close grazing allotments. The plan only identifies where grazing is suitable or not. Instead, it would guide where, and how grazing would be managed. New authorizations or re-authorizations would occur after site-specific analysis and undergo Endangered Species Act consultation.

Grizzly bears are more prone to come into conflict with sheep grazing. In the proposed action, the only sheep allotment currently in the plan area would be found unsuitable under the proposed action. There are currently no active sheep allotments in the plan area. It is assumed that additional sheep grazing is unlikely under the revised forest plan in the future. Existing allotments are cattle allotments which have a lower probability of grizzly bear conflicts, but conflicts are still possible. There have been no documented grizzly bear mortalities associated with livestock that have occurred in the action area since their extirpation circa the 1930’s.

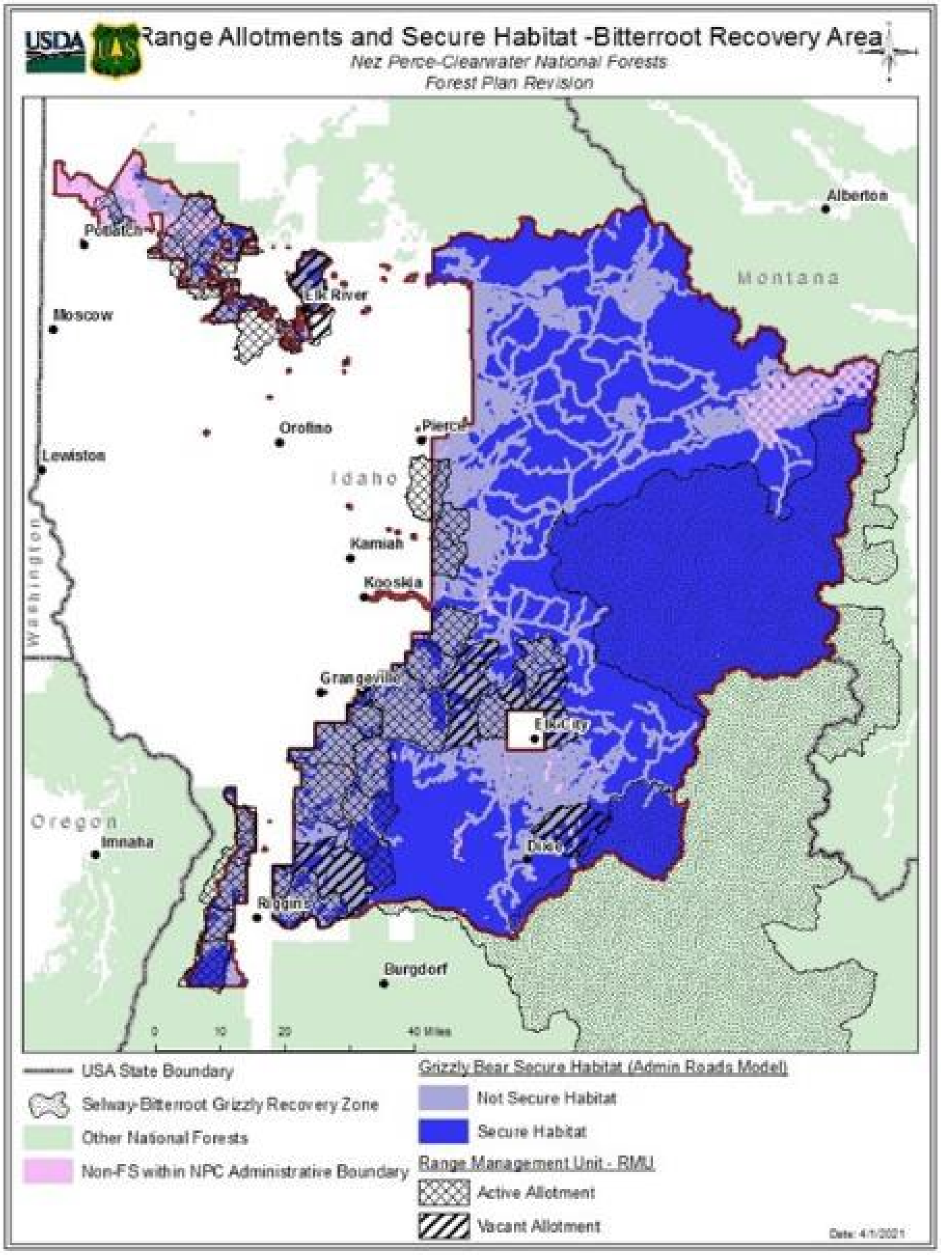


Figure 42. Range allotments in relation to the Bitterroot Recovery Zone and secure habitats

Vegetation Management

Vegetation management is an ongoing activity within the forest currently and will continue after the revised forest plan is revised. Vegetation management as considered here includes timber harvest, timber production, prescribed fire and fuels reduction, habitat restoration, forest restoration, and planting. The trend in vegetation management has changed through the decades in response to demand, capacity, and regulatory constraints. Table 90 shows the acres of harvest, prescribed fire, and fuels reductions since 1987.

Table 90. Vegetation management activities by type and decade from 1987 to 2018

Decade	Harvest[1] Acres	Prescribed Fire[2] Acres	Fuel Reduction[3] Acres
1987-1996	25,827	24,706	20,443
1997-2006	10,299	39,154	15,667
2007-2016	4,999	5,810	7,905
2017-2018	6,200	971	655

[1] Harvest activities include even-aged, uneven-aged, and intermediate harvest treatments.

[2] Includes overlap of burning in harvested stands. Prescribed fire activities include broadcast burning, jackpot burning, site preparation burning, and under burning. Wildfire acres are not included; see the Fire Management section for information on past wildfires, including those used for resource benefit.

[3] Fuel reduction treatments include burning of piled material, chipping of fuels, compacting/crushing of fuels, fuel break, miscellaneous treatment of natural fuels, piling of fuels, rearrangement of fuels, and thinning for hazardous fuels reduction.

Data Source: FACTS database, acres completed by fiscal year up to September of 2018

Vegetation conditions within the Nez Perce-Clearwater National Forests are departed from historic conditions in some important ways. First, white pine was more prevalent than it is today, dominating many areas within the Clearwater National Forest. White pine has decreased through a combination of mostly mortality from blister rust but also some from historic harvest practices. White pine has been replaced by growth of Douglas fir, grand fir, or Western hemlock in its stead and now exists at a fraction of its former dominance. It's unknown how the change in dominance types has altered the ecological conditions to serve as grizzly bear habitat.

Decades of fire exclusion has also changed the composition and condition of vegetation. Fire exclusion has increased forest density, favored fire intolerant tree species, and decreased forest resilience. With fire exclusion, dense understories and thickets of conifers have produced stands that are highly susceptible to a variety of insect and disease epidemics and severe wildfires. Many stands have missed a complete fire return interval and are now considered departed from the historical or reference conditions. It is unknown what effect, if any, this would have on grizzly bears, once they re-establish in the plan area.

Whitebark pine is another species affected by blister rust and has declined in abundance. Whitebark pine is known to have provided mast thought important for grizzly bear nutrition. The loss of whitebark pine has potentially reduced a food source for grizzly bears. Ongoing restoration efforts have been made to restore whitebark and white pine. See the Whitebark Pine section of this document for more information.

The 1987 forest plans projected high timber outputs. For example, the Nez Perce Plan identified an allowable sale quantity of 108 million board feet in the first decade and which increased to 210 million board feet between 2018 and 2027. The Clearwater Plan identified a yearly timber volume of 173 million board feet per year. Despite these projections, the existing amount of timber production is the acreage conducted annually under the 1987 plans which has typically been 4,300 acres or 50-60 million board feet per year on both forests combined.

Most of this timber production occurs within the roaded front, while roadless rule areas receive limited timber harvest, and designated wilderness does not allow timber harvest. Even when allowed, timber harvest is limited within Idaho Roadless Rule areas. For example, the final environmental impact statement for the Idaho Roadless rule projected that less than 0.01 percent of roadless area per year of the lands managed under the Idaho Roadless Rule would be affected by timber removal or road construction in the first 15-years. For the nearly 1,500,000 acres of roadless areas on the Nez Perce-Clearwater, this would total 1,500 acres over the 15-year period, or approximately 100 acres per year (U.S. Department of Agriculture 2008b). Per the Idaho Roadless rule, timber harvest activities must be conducted from existing roads or aerial harvest systems. In the 10-year period from October 2008 to September 2018, approximately 1,800 acres Statewide have been affected through community protection zone fuels reduction, constructed fuel breaks during wildfires, and removal of post-fire roadside hazard trees. Timber harvest in the Idaho Roadless Rule areas usually must occur from existing roads. This trend and rate of timber harvest in Idaho Roadless Rule areas is expected to continue.

The acres of total vegetation treatments under the proposed action ranges between 53,000-64,500 acres. These acres include prescribed fire, wildland fire use, timber production, fuels treatments, wildlife habitat enhancement, and vegetation treatments designed to restore vegetation characteristics found in the forest plan desired conditions. These acres include treatments that would occur forest wide.

Forests are naturally dynamic and experience periodic disturbances like wildfire, insects and disease, and regrowth. Grizzly bears evolved within these dynamic landscapes and use different successional stages to meet their nutritional needs. They use mature forest for hiding, resting, and use early seral stages to forage. Diversity in successional stages provides diverse foods, cover, denning habitat, and space for this wide-ranging species. Vegetation conditions provide a variety of coniferous forests, deciduous forests, wetland and riparian areas, and grass/forb/shrub patches found in areas such as meadows, avalanche chutes, burned areas, and logged areas. Timber harvest, wildfire, prescribed fire, and other vegetation management activities also alter the seral stage, the amount and arrangement of cover, and forage. Vegetation management can increase the quantity and quality of grizzly bear foods through increased growth of grasses, forbs, and berry-producing shrubs (Zager et al. 1983, Kerns et al. 2004).

Fifty-eight studies, published from 1983 to 2020 evaluated the effects of timber harvest on grizzly bear habitat use (Colton et al. 2021). They found that all studies reported grizzly bear use of forest cut blocks, with several reporting grizzly bear selection of cut blocks, however with substantial variation in selection across seasons and ecoregions. (Colton et al. 2021) identified seven underlying factors that influence grizzly bear responses to forest harvest including natural forest openings, cut block design, silvicultural techniques, age since harvest, grizzly bear food availability, human activity, and grizzly bear sex and age. Furthermore, they suggested that grizzly bears may frequently use forestry cut blocks when forage is present, especially if human activity is minimal and natural forest openings are limited.

Forage resources

The plan area likely has sufficient food resources to provide for a future population of grizzly bears. The plan area contains food sources such as ungulate populations, berries, insects, mast from trees such as whitebark pine seeds, vegetation, and fish including cutthroat trout, steelhead, and salmon. Food sources have changed over the last century due to a variety of factors and will continue to change. For example, whitebark pine has experienced a decline due to blister rust. Similarly, elk populations have fluctuated over time. Elk numbers are currently lower than they were in past two decades but are much higher than they were in the early 1900’s when elk were scarce (Cochrell 1970, Space 1981). Elk were also uncommon when Lewis and Clark came over the Lolo Trail in 1805. They never killed an elk in the entire Clearwater Valley, nor do they mention having seen one (Space 1981). Fruit resources such as berries fluctuates from season to season due to weather and precipitation, but also over longer periods with forest disturbance and succession.

Big Game Management and Hunting

The Idaho Department of Fish and Game regulates hunting and hunting practices. Big game hunting is allowed on National Forest lands and has in other areas led to grizzly bear-human conflicts when grizzly bears are attracted to big game carcass or encountered while hunting. Schwartz et al. (2010a) found that bears that spent more time in areas open to hunting had lower survival than those that spent time in areas closed to hunting. Fifty-three outfitter and guides are permitted on the Forest. Hunting occurs on the forest by both guided and unguided hunters for big game. The use of bait for the purpose of taking resident game on National Forest System lands is a hunting practice. Where states permit the use of bait for attracting resident game, this activity is allowed on National Forest System lands, subject to state hunting laws and regulation, unless the authorized officer determines on a site-specific basis that there is a need to prohibit or restrict the practice (FSM 2640). Bear baiting for the purpose of hunting black bears is allowed by the State of Idaho. The state also allows black bear hunting with hounds, and hunters hunt black bears during the black bear season without the use of bait or hounds. Baiting can unintentionally draw in grizzly bears as happened in 2007 where a male grizzly bear was accidentally killed by a hunter near Kelly Creek within the Nez Perce-Clearwater National Forest.

Climate Change

The Climate Change Vulnerability and Adaptation in the Northern Rocky Mountains (Halofsky et al. 2018b;c) is the best available science on climate change and its effects on forested ecosystems in the Northern Rockies. Halofsky et al. (2018) asserts that global climate models project that the Earth's current warming trend will continue throughout the 21st century in the Northern Rockies. The Northern Rockies Adaptation Partnership region covers 183 million acres, spanning northern Idaho, Montana, northwestern Wyoming, North Dakota, and northern South Dakota, and includes 15 national forests and 3 national parks across the U.S. Forest Service Northern Region and adjacent Greater Yellowstone Area. Compared to observed historical temperature, average warming across the five Northern Rockies Adaptation Partnership subregions is projected to be about 4 to 5 °F by 2050, depending on greenhouse gas emissions. Precipitation may increase slightly in the winter, and slightly lower in summer than during the historical period of record, although the magnitude is uncertain. This document predicts that droughts of increasing frequency and magnitude are expected in the future, promoting an increase in wildfires, insect outbreaks, and nonnative species. These periodic disturbances, will rapidly alter productivity and structure of vegetation, potentially altering the distribution and abundance of dominant plant species and animal habitat (Halofsky et al. 2018a). Some of these changes could already be occurring on the Nez Perce-Clearwater National Forest.

The most likely ways in which climate change may potentially affect grizzly bears are a reduction in snowpack levels, shifts in the denning season, shifts in the abundance and distribution of some natural food sources, and changes in fire regimes due to summer drought. The potential effects would likely be variable and are difficult to predict. Grizzly bears are habitat generalists and opportunistic omnivores, which may make them less susceptible to changes in plant communities than some other wildlife species.

Pigeon et al. (2016) studied the influence of ambient temperature on habitat selection patterns of grizzly bears in the managed landscape of Alberta, Canada. Grizzly bear habitat selection followed a daily and seasonal pattern that was influenced by ambient temperature, with adult males showing stronger responses than females to warm temperatures. The study demonstrated that ambient temperatures, and therefore thermal requirements, play a significant role in habitat selection patterns and behavior of grizzly bears.

Roberts et al. (2014) estimated the impact of warmer future climate on grizzly bears in the southern Canadian Rocky Mountains. They used presence–absence information to estimate ecological niches of food plants and projected changes in future distributions of each species. Many food items persisted or even increased, although several species were found to be vulnerable based on declines or geographic shifts in suitable habitat. Roberts et al. (2014) concluded that, a wide diet breadth of grizzly bears, as well as wide environmental niches of most food items, make climate change a much lower threat to grizzly bears than other bear species.

Effects of the proposed action

Methods for Effects Analysis

It is important to note that the revised plan does not authorize, fund, or carry out site-specific allowances, prohibitions or activities; rather it establishes overarching direction for future land management actions. Management direction in the revised forest plan will go into effect once the final record of decision is signed by the Forest Supervisor and is expected to guide management and decision-making processes for approximately 15 years. Therefore, the effects of the plan components and land allocations on grizzly bears are indirect effects which could occur from activities conducted under the plan in the future.

The primary focus of this analysis is the effects on connectivity and future potential occupancy of the Bitterroot Recovery Zone. The key indicator is the spatial overlap and consequences of plan direction on secure habitat as a surrogate for effects to grizzly bears. The spatial overlap of plan direction in many ways determines the effects. Loss of secure habitat could affect grizzly bear presence, survival, dispersal, and connectivity. The effects are comparative in that the analysis is evaluating the change in existing plan direction and conditions compared with direction in the revised forest plan. The analysis evaluates allocations of recommended wilderness, suitable wild and scenic rivers, timber suitability, suitability of lands for summer and winter motorized uses, suitability for various levels of recreation, and allocation of management area and associated direction. The analysis also evaluates plan direction for domestic livestock grazing, recreation, vegetation management, minerals and energy, and grizzly bear/human interactions. It also evaluates the effects of plan components and objectives identified in the plan. The analysis focuses on the effects of existing conditions and potential implementation of the Forest Plan on any grizzly bears that may be present, as well as considering the ability of the area to contribute to connectivity between grizzly bear recovery zones. The analysis assumes that grizzly bears would eventually establish a population within the plan area through natural dispersal. Grizzly bear presence within the plan area currently is sporadic and is composed of males. Therefore, the key indicators are how the proposed action would affect secure habitat that would be required in the event female grizzly bears migrate into the plan area. Lastly, the analysis indicates plan direction that might increase the probability of mortality of bears that may be present or grizzly bears that might move into the forest in the future.

The analysis first evaluates how the proposed action would affect the potential for the Bitterroot Recovery Zone to host a future population of grizzly bears. The proposed action identifies recommended wilderness, the amount of various classes of summer and winter recreation opportunity settings, the suitability of wild and scenic rivers and the associated ¼ mile river corridor, the area suitable for timber production, and the acres of disturbance or restoration of forest vegetation per year. Thus, timber production amounts will not be analyzed spatially except where timber harvest is suitable. There is a high degree of uncertainty with the effects analysis because it is unknown where grizzly bears will come into the forest, where they will reside once they arrive, and whether they will stay within the Bitterroot Recovery Zone.

Effects of The Plan on the Ecological Conditions within the Bitterroot Recovery Zone

The revised plan will not change the boundaries or characteristics of the Bitterroot Recovery Zone in how it contributes to the recovery of the grizzly bear because it is composed of congressionally designated wilderness, which will not be changing in the revised plan. Suitability plan components find the following activities unsuitable in wilderness: timber production, timber harvest, permanent road construction, temporary road construction, locatable minerals, leasable minerals, new facilities, motorize recreation, over snow motorized recreation, and mechanical transport. Grazing may be suitable in allotments established before the wilderness was designated, depending upon the enabling legislation.

Plan direction in section 5.5.1 designated wilderness provide direction for the designated wilderness areas that make up the Bitterroot Recovery Zone. MA1-DC-WILD-01 is a desired condition that states that management shall preserve and protect wilderness character as required by the Wilderness Act and enabling legislation. MA1-DC-WILD-02 is a desired condition for natural ecological processes and disturbance to be the primary forces affecting vegetation. Standards MA1-STD-WILD-01 and MA1-GDL-WILD-01 require wilderness management plans to be in accordance with Wilderness Management Plans. Plan directions for suitability restrict several activities mentioned above. These plan components would maintain the ecological conditions to contribute to recovery. Plan direction does allow prescribed fire and some livestock grazing within the wilderness areas. Of course, as with all projects carried forth under the guidance of the revised plan, these actions would still undergo NEPA analysis and Endangered Species Act consultation prior to authorization. Grazing is an ongoing activity that would undergo analysis and consultation before a reauthorization.

Even though wilderness management keeps habitats intact, it does not protect bears from human-bear conflicts. There is no plan direction that requires storage of food or attractants. Such an order can be instituted outside the forest plan though a special order. Efforts to institute a special order are currently being considered. The lack of an order may place any bears that may be present at risk until a food storage order is implemented. However, FW-DC-WL-07, FW-DC-WL-08 seek to educate the public about bear safety measures and direction to provide infrastructure at developed recreation sites.

The Bitterroot Recovery Zone on the Nez Perce-Clearwater is largely ungrazed by domestic livestock, save for about 380 acres of one allotment that overlaps the recovery zone near the Big Mallard Creek trailhead within the Frank Church River of No Return Wilderness. The allotment is currently vacant and not currently grazed. There is some risk to grizzly bears associated with livestock grazing within the Bitterroot Recovery Zone. Conflicts with livestock could lead to some bear removals or deaths. Because the livestock grazing allotment in the Recovery Zone permits cattle (not domestic sheep) and is currently vacant, the risk of adverse impacts on grizzly bears due to forage competition, displacement, or livestock-related mortality is lower than for other livestock types. The overlap and proximity to the Bitterroot Recovery Zone could lead to livestock depredation in the event the allotment resumes grazing and, in the event grizzly bears become present.

The Bitterroot Recovery Zone is mostly coincident with the Selway-Bitterroot and Frank Church River of No Return Wilderness areas, but does include some portions of the Magruder Corridor, which was excluded from wilderness in the Central Idaho Wilderness Act (1980). There are also some small areas that are not wilderness that were included in the Bitterroot Recovery Zone. The largest block of secure habitat in the plan area is a contiguous block of secure habitat of approximately 1,103,922 acres without any roads nor motorized trails and is centered over and around lands surrounding the Bitterroot Recovery Zone. The Forest has 935,715 acres of the Bitterroot Recovery Zone, of which 926,732 acres are secure habitat by our definition. That is, the Bitterroot Recovery Zone is 99 percent secure habitat. There is only about 6.6 miles of road within the Recovery Zone along the Magruder Road. Some other roads along the border the Recovery Zone affect secure habitat, but the roads don't cross into it. Resulting road density is 0.004 miles per square mile within the Recovery Zone. There is little to no possibility of new roads nor motorized trails being constructed in the future in the wilderness because these are prohibited by the wilderness act. These areas alone provide the ecological conditions to contribute to grizzly bear recovery so long as bears can disperse there. Only 9,002 acres (less than 1 percent) within the Bitterroot Recovery Zone is not secure habitat. The loss of some secure habitat is mostly due to the Magruder Road but also because of some other access points up to the wilderness boundary.

The Bitterroot Recovery Zone within the Nez Perce-Clearwater only has one road, the Magruder Road or Forest Service 468, which passes through about six miles of the recovery zone before it passes into the

Bitterroot National Forest. This road is the only road that passes through any of the Bitterroot Recovery Zone within the plan area. No other roads are allowed within designated wilderness areas. Thus, the number of roads within the Recovery Zone are very low and are expected to remain low.

Timber harvest, silviculture treatments, fuels projects, and other vegetation management projects are generally not allowed within designated wilderness areas. Neither timber harvest nor timber production are suitable within wilderness areas and thus are prohibited under the proposed action. The plan components contain some direction to encourage treatment of noxious weeds in wilderness areas. The plan also allows prescribed fire as a suitable use in wilderness. These components and activities would have negligible effects or beneficial effects on grizzly bears. Prescribed fire treatments may create early seral conditions that can improve forage opportunities for grizzly bears. They may also form thick stands of shrub that could contribute to hiding cover. The Forest Plan does not authorize any of these activities, it only identifies these as suitable uses. In all cases, federal actions conducted under the guidance of the Forest Plan would be required to be consistent with the plan and undergo additional site-specific analysis and Endangered Species Act consultation prior to authorization.

New developed recreation sites are not allowed within designated wilderness. There are a few campgrounds near the boundary of the Bitterroot Recovery Zone. There are two developed recreation camp sites along the Magruder Road, which are on the boundary of the recovery zone near the Frank Church-River of No Return Wilderness. There are two other developed campgrounds near the Selway Bitterroot Wilderness – one near Elk Summit and another near Big Fog Saddle. These developed sites are outside of the recovery zone but near the boundary. Farther away are nine developed campgrounds along the Lochsa River that could potentially attract grizzlies outside of the Recovery Zone. When bears become established, these sites may attract bears from within the Recovery Zone and lead to human conflict and bear death. Measures to educate the public and provide food storage infrastructure, as in FW-DC-WL-07 and FW-DC-WL-08, would direct management to address these concerns if, and when necessary. The forest is currently engaging in efforts to educate the public about bear safety.

New minerals and energy developments are not allowed in designated wilderness, and most mineral rights were withdrawn with exceptions in enabling legislation. These would continue to be prohibited under the revised plan in the Bitterroot Recovery Zone in the future.

Essentially the Bitterroot Ecosystem Recovery Zone will continue to provide the ecological conditions to contribute to the recovery of the grizzly bear under all alternatives. However, because grizzly bears must disperse naturally into the Recovery Zone in order to become established, the way the plan provides for connectivity for grizzly bears is a key consideration for how the revised plan will contribute to the recovery of the grizzly bear and is evaluated below. Bears traveling into the Recovery Zone from other ecosystems face more threats and stressors.

Effects of Revised Forest Plan Direction on Grizzly Bear Connectivity

The analysis throughout the rest of the document is evaluating whether the plan provides for the ecological conditions for grizzly bear dispersal through the forest into the Bitterroot Recovery Zone. The Revised Forest Plan establishes a framework with three overarching Management Areas. These areas are called Management Area 1, Management Area 2, and Management Area 3.

A description of these areas is included in Chapter 1 of the revised forest plan. To summarize, Management Area 1 includes designated areas such as designated wilderness and designated wild and scenic rivers. Management area 2 includes areas recommended under the plan and the Idaho Roadless Rule Areas. Management Area 2 would include research natural areas, recommended wilderness areas, and suitable wild and Scenic Rivers for example. Management area 3 are lands for multiple uses.

Management Area 3 occur within approximately 1,217,683 acres of the forest under the existing condition but is 1,240,340 acres under the proposed action. Management Area 3 would include areas that currently have more roads, most campgrounds and infrastructure, more human use, and are managed for timber production. While the plan does not authorize any of these uses, these types of activities would continue under the broad direction of the plan. Management Area 3 is identified in the plan to emphasize these uses. As such, most of these activities generally would be suitable within Management Area 3 save for restrictions specified within plan components. For example, several activities are unsuitable or restricted within Riparian Management Zones.

The plan does not authorize, carry out or fund any specific management activities. Instead, the plan sets the framework under which activities would be conducted. In general, Management Area 3 has few restrictions on management activities. Objectives for a variety of activities are identified in the plan. Examples include timber production, fire or fuels objectives, vegetation restoration, restoration of hardwood species, aspen restoration, soil restoration, aquatic or riparian restoration, invasive species treatments, recreation maintenance, and road maintenance. It should be anticipated that projects and management would be moving towards or achieving desired conditions and that management would fulfill objectives.

This analysis evaluates how ecological conditions for grizzly bears provide for dispersal through these areas into the Bitterroot Recovery Zones. In many ways, these management areas and land allocations provide the ecological conditions to provide for dispersal and habitation outside of the Recovery Zone because they provide broad areas where many activities that could affect grizzly bears are prohibited or restricted through suitability plan components tied to the distribution of these land allocations.

Dispersal between disjunct populations can play an important role in the persistence of a species by increasing genetic diversity in the receiving population, facilitating colonization and recolonization of unoccupied habitats, and augmenting the numbers of small populations (Hanski and Gilpin 1997, Mattson and Merrill 2002). In the rest of the analysis below, the effect of the Nez Perce-Clearwater Revised Forest Plan is evaluated in this larger context for connectivity.

During the establishment of the Bitterroot Recovery Zone, alternatives were considered for how grizzly bears would become established. The selected alternative was for reestablishment of grizzly bears via transplant under the authority provided in 10(j) of the Endangered Species Act. The Bitterroot Recovery Zone lies between populations of grizzly bears in other ecosystems. Thus, dispersing bears from one or more of the ecosystems is important to the establishment of bears into the Bitterroot Ecosystem. The plan area contributes to this dispersal from grizzly bear ecosystems north or east of the Nez Perce-Clearwater, namely the North Continental Divide, Cabinet-Yaak, and Selkirk Ecosystems. The Nez Perce-Clearwater could contribute to connectivity for grizzly bears between the Greater Yellowstone Ecosystem and the other Ecosystems, however connectivity is more likely through other routes than the Nez Perce-Clearwater. For the Bitterroot Ecosystem to have a population of grizzly bears, female grizzly bears would need to become established. Thus, the ability of the Nez Perce-Clearwater to provide connectivity both into and between the ecosystems for female grizzly bears is a key indicator for this analysis.

Figure 33 shows the location of the Bitterroot Recovery Zone in relation to areas occupied by grizzly bears and the other recovery zones. The nearest areas occupied by grizzly bears are from the Northern Continental Divide Ecosystem where grizzly bears have become established outside the boundaries of the Northern Continental Divide Ecosystem. The edge of this occupied polygon is about 15 miles from the nearest Bitterroot Ecosystem boundary and about 13.5 miles from the boundary of the Nez Perce-Clearwater at the nearest locations, as measured in ArcGIS. This distance is near the maximum dispersal distance recorded by McLellan and others for female grizzly bears (McLellan and Hovey 2001b). Based upon these distances, the most likely source of female bears to show up in the Bitterroot Ecosystem by natural dispersal may be those from the Northern Continental Divide, the Cabinet-Yaak, or Selkirk Ecosystems. Despite the proximity, bears face significant barriers coming from Northern Continental Divide Ecosystem into the Nez Perce-Clearwater because of human development along the I-90 corridor (Servheen et al. 2003b).

The boundary of the Cabinet-Yaak Recovery Zone is about 35.8 miles from the northern boundary of the Nez Perce-Clearwater and about 69 miles from the nearest boundary from the Bitterroot Recovery Zone. The Selkirk Recovery Zone is about 86.9 miles from the nearest Nez Perce-Clearwater boundary and 172 miles from the nearest Bitterroot Recovery Zone boundary, as measured in ArcGIS. However, the incidences noted above from male bears that were observed in or near the Nez Perce-Clearwater have come from the Cabinet-Yaak (2019), Selkirk (2007), and Northern Continental Divide Ecosystem (2018) populations and entered the northern or northeastern area of the Nez Perce-Clearwater. The arrival pattern is expected to continue, though some bears may make it into the Bitterroot Recovery Zone south of Stevensville, Montana.

While perhaps less likely, grizzly bears could also come from the GYE. The closest straight-line distance from the GYE recovery zone and the Bitterroot Recovery Zone is approximately 132 miles as measured in ArcGIS, though the arrangement of terrain and anthropogenic factors might require a grizzly bear to travel a farther distance between the two ecosystems. If we assume that grizzly bears would be more likely to travel along a mountainous path, then a potential travel corridor could exist from the GYE near the Eastern Centennial mountains through the mountainous area along the Idaho-Montana border through the Beaverhead range and into the Bitterroot Recovery Zone on the Bitterroot National Forest. A bear traveling this path would potentially cross the Caribou -Targhee, Salmon-Challis, Beaverhead Deer Lodge, and Bitterroot National Forest, passing North of Salmon Idaho and south of Hamilton Montana. Such a path would require a grizzly bear to cross I-15, and Highway 93 and travel approximately 200 miles. A second, more direct but more fragmented path might include a path from the Madison Range in the GYE north to the Tobacco Root Range, to the highland range, passing south of Butte Montana into the Sapphire Range and then crossing through the mountainous areas between Hamilton Montana and Salmon Idaho into the Bitterroot Ecosystem on the Bitterroot National Forest. This course would require a bear to travel about 150 miles and cross both I-15 and Highway 93.

Table 91. Distance between Nez Perce-Clearwater and Bitterroot Ecosystem Recovery Zone from areas occupied by grizzly bears

Grizzly Bear Recovery Zone or Ecosystem	Distance in miles from the Nez Perce-Clearwater boundary to nearest area occupied by grizzly bears	Approximate Distance in miles from the Bitterroot Ecosystem Boundary from nearest area occupied by grizzly bears
North Continental Divide Ecosystem	13.5	15
Selkirk Ecosystem	86.9	172
Cabinet-Yaak Ecosystem	35.8	69

Most of the area of the Nez Perce-Clearwater north of the Bitterroot Recovery Zone boundaries are composed of either recommended wilderness or Idaho Roadless Rule areas. Provided a grizzly bear advance into the Nez Perce-Clearwater, these areas provide high levels of secure habitat and allow for connectivity to the Bitterroot Ecosystem. These areas are composed of HUC 10 watersheds that have more than 55 percent secure habitat, which should allow for survival and passage.

Areas in Management Area 3 have low amounts of secure habitat and reduce connectivity through some areas. The area near Lolo Pass that has checkerboard ownership has substantial acreage of private land and many miles of private roads. Private lands within the checkerboard area are outside of Forest Service control. Similarly, the general forest management areas of Deception Point and south of the Mallard Larkin area around Indian Henry Ridge has lower amounts of secure habitat. However, grizzly bears may be able to navigate around or even pass through these areas as bear 927 did. Grizzly bears that enter the Nez Perce-Clearwater from the north or east would most likely enter recommended wilderness or Idaho Roadless Rule areas. See figure 46 below –the Bitterroot Ecosystem in relation to the Nez Perce-Clearwater recommended wilderness, Idaho Roadless Rule areas and designated wilderness.

The Nez Perce-Clearwater is bordered on the north, east, and south by other National Forest Service lands. Few Forest Service activities disrupt animal movements across the landscape. The landscape feature most important to the disruption of connectivity for grizzly bears is the road system, motorized trail system, and some recreation facilities.

Note that the use of motorized vehicles off existing designated roads and trails is not permitted on the Clearwater portion of the National Forest, except for travel to dispersed campsites within 300 feet of an open route (U.S. Department of Agriculture 2017). Roads and trails closed to public motorized use sometimes remain available to Forest Service personnel for administrative purposes, including wildfire suppression, search and rescue, medical emergencies, permit administration, data collection, noxious weed treatments, general management, and other activities (U.S. Department of Agriculture 2017). However, they are not used often.

Grizzly bears may modify their behavior temporally in response to road use intensity. Northrup et al. (2012) found that grizzly bears in southwestern Alberta increased their use of areas near roads and moved across roads during the nighttime hours when traffic use was low. During the day, bears crossed and used the areas near roads that had low use (less than 20 vehicles per day) but avoided roads with moderate (20-100 vehicles per day) and high (greater than 100 vehicles per day) traffic volumes. Mace et al. (1996) evaluated seasonal use by grizzly bears of areas within a 0.3-mile buffer surrounding roads in the Swan Mountains, Montana. Most grizzly bears exhibited either neutral or positive selection for buffers surrounding closed roads and roads receiving less than 10 vehicles per day but avoided buffers surrounding roads having greater than 10 vehicles per day. Ruby (2014) found that grizzly bear activity near open motorized routes and human developments in Swan Valley, Montana, peaked during time periods when humans were likely to be less active. Because motorized trails are unlikely to be used at nighttime, there might be less impact on bears from the network of motorized trails than would be suggested by the Boulanger and Stenhouse (Boulanger and Stenhouse 2014) thresholds. The amount of use on most of the roads bordering the Nez Perce-Clearwater National Forest’s Idaho Roadless Rule areas are assumed to be low but exact numbers are not available.

The forest plan does not make travel management decisions at a site-specific level. Instead, it sets the broad direction under which travel management decisions would occur in future projects under the plan. Plan direction that can influence travel management decisions include management area direction, Idaho Roadless Rule direction, wilderness designations, recreation opportunity spectrum settings, individual plan components, and suitability determinations.

The Idaho Roadless Rule area boundaries will not change during forest plan decisions. Idaho Roadless Rule area themes generally will not change in the plan unless the Idaho Roadless Rule area is selected as recommended wilderness. In that case, the Idaho Roadless Rule area theme would be managed as a Wildland Recreation Area. Idaho Roadless Rule areas do not allow new permanent road construction but do allow motorized trails to be constructed.

Secondly, the recreation opportunity spectrum classifications dictate the types of access allowed. The summer recreation opportunity spectrum is most relevant to grizzly bears while the winter recreation opportunity spectrum would not likely have effects on dispersing bears because they would be hibernating during winter travel. However, there is some possibilities that winter recreation may disturb hibernating grizzly bears. The effects of winter recreation on denning grizzly bears are evaluated below. However, wilderness areas and recommended wilderness areas are not suitable for winter motorized recreation and thus would not be allowed under the plan. The summer recreation opportunity spectrum varies by alternative, primarily because selection of recommended wilderness areas would change the recreation opportunity spectrum setting. These factors are analyzed in more detail below.

Demographic connectivity areas were considered during the development of the final environmental impact statement. Demographic connectivity areas are not needed at this time because of the existing regulations that occur as a natural result of roadless rule regulations and wilderness laws, which already provide this connectivity. Some non-motorized summer recreation opportunity spectrum settings in the Preferred Alternative were identified to help provide for grizzly bear connectivity (figure 51). These are non-motorized settings near the Hoodoo recommended wilderness area.

Effects of Management Area Allocation and Direction

The distribution of management areas and overarching direction within each would strongly influence the ecological conditions for grizzly bears across broad areas related to developments and human-bear conflicts. The revised forest plan framework allocates the entire Forest into one of three management areas that would have distinctive management. As described in the existing condition section above, this is a substantial change compared to the 1987 plans developed under the 1982 Planning Rule where there were many management areas each with distinct emphasis. Under the proposed action, the Nez Perce-Clearwater lands are divided into three broad management areas identified as Management Area 1, Management Area 2 and Management Area 3. These broad management areas are arranged from a suite of designated, proposed, and non-designated lands. Each management area follows a broad theme with lands in Management Area 1 being composed of areas designated by congress. Management Area 2 lands are composed of lands set aside by the Idaho Roadless Areas and lands recommended for congressional designation or other designations, while Management Area 3 is made up of lands managed sustainably for multiple uses. However, some lands have more than one designated or proposed area where more than one set of management direction would apply. In cases, where multiple designated or proposed land allocations overlap, management direction for all land types applies. According to the plan, where management direction of the different management areas conflicts, the more restrictive direction prevails. The acres of each management area and sub-management area, as well as the acres of secure habitat are shown in table 92.

There is little flexibility in changing the distribution of these three broad Management Areas because they are identified by already established boundaries such as Designated Areas and Roadless Rule Areas. While the distribution of the three management areas are relatively static, the suitability of uses and intensity of allowed uses are discretionary. For example, suitability, Recreation Opportunity Spectrum designations, pace of vegetation restoration, wild and scenic suitability, amount of fuel treatments, objectives, and intensity of use are established in the plan and vary between the different management areas.

The effects of Management Area allocation combined with their respective restrictions on suitability of uses, and management area specific plan components forms the basis for broad protections across the much of landscape for grizzly bear habitat. The effects of management area allocation are described here and analyzed to provide a big picture overview of the effects of management area allocations. Additional detailed analysis specific to each type of land allocation are presented individually and in detail in the following sections of the Biological Assessment: Effects of Suitability Plan Components, Effects of Designated Wilderness Area Direction, Effects of Recommended Wilderness Allocation and Management, Effects of Designated Wild and Scenic Rivers Management, Effects of Direction within the National Historic Landmark, Effects of Idaho Roadless Rule Direction, and Eligible and Suitable Wild and Scenic Rivers. Additional related analysis is found in How the Plan Addresses Motorized Access, and Plan Direction that Contributes to Grizzly Bear Recovery.

Management Area 1 is composed of three areas designated by congress for specific uses and that have restrictions or special management direction prescribed by law. These include designated wilderness, designated wild and scenic rivers, and the congressionally designated Lolo Trail National Historic Landmark. These designations offer high levels of land protections against developments. Plan components or direction specific to these areas in the plan are labeled with MA1.

Plan direction within Management Area 1 includes specific areas of the plan with plan components directing the management of designated wilderness, designated wild and scenic rivers, and the National Historic Landmark. There are also management area specific plan components scattered throughout the plan that also apply to these management areas. The specific plan direction and a description of the effects for these areas are described in detail in the respective sections of the BA below (for example Effects of Designated Wilderness Area Direction) and in the section of the BA called "Plan Direction that Contributes to Grizzly Bear Recovery" below. They include desired conditions, standards, guidelines, and suitability of uses that would maintain and protect these areas in a condition for connectivity and even a future population of grizzly bears in these areas. Under the plan, the amount of secure habitat would be expected to change only slightly in Management Area 1. Additional analysis is provided below in the Effects of Designated Wilderness Area Direction, Effects of Designated Wild and Scenic Rivers Management, and Effects of Direction within the National Historic Landmark sections.

The Bitterroot Recovery Zone is nearly all Management Area 1 lands. Existing roads in these areas can be seen in figure 44 and figure 45 below. Management Area 1 provides high levels of protection against the loss of secure habitat with the limited exceptions of areas within Designated Wild and Scenic Rivers where motorized uses are suitable, and within the National Historic Landmark. Designated wild and scenic rivers and the National Historic Landmark areas make up about 92,579 acres or about 7.5 percent (1B and 1C lands in table 92) of Management Area 1.

These areas are almost all secure habitats and will largely remain secure into the foreseeable future. The result of this management direction is that the 1,231,638 acres of Management Area 1 lands are highly protected for the future establishment and recovery of grizzly bears. Management Area 1 lands are currently composed of 1,145,141 acres or 93 percent secure habitat and wilderness management in the plan will continue to maintain these secure habitats into the future. The bulk of Management Area 1 is designated wilderness at 1,139,059 acres, thus 92.4 percent of Management Area 1 lands are managed and protected as designated wilderness areas. A total of approximately 1,124,066 acres of wilderness or 98.6 percent is secure habitat.

Management Area 2 consists of lands composed of backcountry areas with moderately restrictive management because they are either proposed for designation, roadless areas, or were set aside legislatively as restrictive land management types. Management Area 2 consists of Idaho Roadless Rule Areas; proposed areas such as recommended wilderness, or rivers proposed as suitable or eligible for congressional consideration as wild and scenic rivers; designated and proposed Research Natural Areas, and the Gospel Hump Multi-Purpose area. The Gospel Hump Multi-Purpose Area was established by legislation for specific management when the Gospel Hump Wilderness was established. Management Area 2 is composed mostly of lands within Idaho Roadless Areas, but also includes significant acreage of recommended wilderness areas, and smaller amounts of eligible and suitable wild and scenic rivers, proposed and designated research natural areas, and the Gospel-Hump Geographic Area. This management area is made up of relatively large areas, generally without roads, few motorized trails, and provides a variety of recreation opportunities. Existing roads and motorized trails in management area 2 can be viewed in figure 44 and figure 45. In many cases the different land allocation types overlap each other. Table 92 below shows the acres of land allocations within Management Area 2 including those with overlapping land allocations.

Revised forest plan direction for Management Area 2 would apply to project within any and all land allocation types they occurred in. In many areas, more than one set of set of plan direction would apply. For example, if a project fell within a sub-management area that had Idaho Roadless Rule areas, suitable Wild and Scenic river corridor, and Research Natural Area, then all of the plan direction including suitability from each sub-management area would apply to that project. In recommended wilderness, both Idaho Roadless Rule Area restrictions apply, and recommended wilderness area restrictions apply. If conflicting plan guidance is discovered, the direction from the more restrictive management area would apply. Generally, the following order is presumed to be in order from most restrictive to least and generally will be used to determine which plan components shall be applied, though the final decision will be made during project level analysis:

Designated Wilderness and Designated Wild and Scenic Areas – Management Area 1

Lolo National Historic Trail

Designated Research Natural Areas

Proposed Research Natural Areas, Suitable Wild and Scenic Rivers, and Recommended Wilderness

Idaho Roadless Rule, unless directed by the rule itself, which supersedes a Land Management Plan

Geographic Area Plan Components

Management Area Plan Components for MA 3

Forestwide Plan Components

Plan direction for Management Area 2 is found in section 6.6 of the revised forest plan and includes broad direction for recommended wilderness, eligible and suitable wild and scenic rivers, Idaho roadless rule areas, proposed natural research areas, and designated natural research areas. Specific direction includes desired conditions, guidelines, standards, and suitability that would mostly conserve these areas for the future use of grizzly bears. Additional management area specific plan components are also scattered throughout the plan and would also apply in this management area. In the revised forest plan, components specific to this management areas begin with Management Area 2. Generally, plan components would direct managers to maintain wilderness character within recommended wilderness areas, maintain roadless characteristics in roadless rule areas, and maintain outstandingly remarkable values within suitable within wild and scenic rivers.

Activities are restricted to various degrees in Idaho Roadless Rule Areas, consistent with the Idaho Roadless Rule. The plan components that restrict various activities across broad areas are primarily the suitability plan components specified for each Management Area 2 land allocation, though there are also standards and guidelines that also restrict activities. Depending on location, activities that are constrained to various extents include timber production, timber harvest, permanent road construction, temporary road construction, some mineral extraction activities, construction of new buildings or facilities, over snow vehicle travel, motorized travel, and mechanized travel. Vegetation management emphasis is to restore and provide variety in size classes, dominance types and density as informed by the natural range of variation for vegetation conditions under natural disturbance regimes. While timber production is generally prohibited, timber harvest can be used to treat vegetation for restoration purposes but must generally be conducted from existing roads. Additional analysis of how plan components contribute to recovery of grizzly bears can be found within the section of the BA below called "Plan components that contribute to ecological conditions for grizzly bear recovery."

Management Area 2 has mechanisms to restrict loss of secure habitat. First, in recommended wilderness, road and motorized trails are not suitable uses and are prohibited. Second, the plan restricts road building with only limited exceptions consistent with the Idaho Roadless Rule, but motorized trails are allowed. However, the plan also contains plan components for elk and grizzly bear in MA2-GDL-WL-05 would provide restrictions on the amount and location of motorized trail construction that would be allowed. For example, this guideline requires there to be areas of 5,000 acres without motorized access remaining when constructing motorized trails. These measures help ensure that areas of potential dispersal would largely be maintained because they greatly restrict the construction of new roads and constrains construction of motorized trails. Additionally, it would ensure that grizzly bears could pass through these areas and even occupy them because these minimum sized areas are larger than areas identified by Wakkinen and Kasworm (1997) who suggested that areas 1280 acres and larger were used more by grizzly bears than smaller blocks.

The direction for these areas would provide connectivity and while there are more roads and motorized trails than in Management Area 1, these areas also provide abundant secure habitats. The amount of secure habitat in this management area would be expected to decline some due to development of future motorized trails, though the amount and location is unknown at this time. Grizzly bears in this management areas would find habitat conditions that support female survival but a higher probability of human-bear conflicts than in Management Area 1. This is because most of this management area is composed of secure habitat that would largely be retained under the plan. While use by the public is expected to increase over time. The probability of human-bear conflict would be far lower than in Management Area 3. This direction would help to maintain ecological conditions to support a future grizzly bear population within Management Area 2 and support connectivity into the Bitterroot Recovery Zone from other ecosystems. This direction would help to maintain ecological conditions to support a future grizzly bear population. Additional detailed analysis related or influenced by Management Area 2 direction is provided below in the Effects of Recommended Wilderness Allocation and Management, Eligible and Suitable Wild and Scenic Rivers, Effects of Idaho Roadless Rule Direction, Timber Suitability, Production, Harvest, and Vegetation Restoration; Effects of Motorized Suitability and Summer Recreation Opportunity Spectrum, Effects of Winter Recreation Opportunity Spectrum and Suitability, and How the Plan Addresses Motorized Access sections.

Collectively, Management Areas 2 lands result in a block of land 1,467,078 acres where the plan direction constrains roads and motorized trails, of which 1,124,882 acres or approximately 76.6 percent is currently secure habitat. Most of this management area would remain as secure habitats into the future due to the collective constraints mentioned above. However, they are not completely protected against new motorized roads and trails as some Management area 2 lands are suitable for motorized uses and have the potential to be impacted by new motorized trails. A map of existing roads and motorized trails are shown in figure 44 and figure 45. These areas provide conditions to facilitate connectivity and even occupancy of grizzly bears outside of the recovery zone.

The combined effects of Management Area 1 and 2 direction is that 2,698,716 acres of habitat is either fully protected or partially protected by either the highly restrictive plan direction for Management Area 1 lands or the constraining direction of Management Area 2. Combined these lands have 2,268,274 acres of secure habitat currently or are 84 percent secure.

Areas outside of designated and propose areas are managed for multiple uses and are identified as Management Area 3. These are lands that have no other restrictions or special management imposed by designation or regulation and are not identified as areas recommended for congressional designation. These areas are commonly referred to as the managed front or front country. They are managed to provide for integrated social, economic, and ecological sustainability, and ecosystem integrity and diversity while providing for ecosystem services and multiple uses. The managed front typically includes more roads, the majority of the campgrounds and infrastructure, more human use, and in many cases are managed for timber production.

Management area 3 includes lands managed for multiple uses, with emphasis on vegetation management, timber production, road, or motorized access, developed recreation, and wildfire prevention especially within the Wildland Urban Interface, among other uses. This management area currently has more intensive recreational use, many roads and little secure habitat. There are very few constraints on activities within Management Area 3 in the plan. Existing roads in relation to Management Area 3 are shown in figure 44 and figure 45 below.

Grizzly bears in this management area would be expected to have lower survival and a higher probability for human-bear conflicts. The amount of secure habitat by Management Area is shown in table 93 and table 92 below. The road system accesses most of this management area currently and it is anticipated that additional roads would be developed to provide for recreation opportunities and to harvest timber. Therefore, the already low amounts of secure habitat could decline some. Only 16 percent of the secure habitats in the plan area occur in this management area, and secure habitats total only 194,805 acres in this Management Area. Of note, the majority of the roads closed to the public but open to administrative uses occur in this management area and as was mentioned above in the existing condition if administrative roads were not counted towards secure habitat, an additional 258,525 acres would be secure, most of which would be within Management Area 3. Management Area 3 is not biologically suitable nor socially acceptable for grizzly bear occupancy and if grizzly bears move into this management area, they would experience a higher probability of human-bear conflict.

Management Area 3 contains some lands where management direction was established by the Endangered American Wilderness Act (1978) which created the Gospel Hump Wilderness Area. Three areas totaling 92,000 acres were established for multiple resource development and is referred to as the Gospel-Hump Multi-Purpose Area. A portion of these areas occurs within Management Area 2 and another portion occurs within Management Area 3. The plan established these areas as The Gospel Hump Multipurpose geographic area. The plan contains specific plan components for the geographic area including desired conditions, objectives, and guidelines. The desired condition is for the area to provide quality fish and wildlife habitat, motorized and non-motorized recreation opportunities, areas available for timber harvest to meet social and economic demand, and opportunities for research. The areas within Management Area 3 are emphasized for multiple uses.

The grizzly observations near Whitebird, Fish Creek, and Newsome Creek were within this future Management Area 3 without incident. Bear 927 passed through portions of Management Area 3 in the Lolo pass area. Bear 927 even used the area of checkerboard ownership within Management Area 3 during his time here. However, these observations suggest that these areas may still be permeable to grizzly bears to some extent. These areas are not managed to emphasize grizzly bears. Management Area 3 would still be somewhat permeable to dispersing bears because even though it has more motorized access, most roads are low speed, gravel forest roads with comparably low amounts of traffic compared to highways. These conditions should not prevent grizzly bears from passage. Of note is the checkerboard ownership near Lolo pass, which has mixed forest service and private ownership and many roads. While that area has more roads, the private lands are owned and managed by a commercial timber company and thus are managed in mostly an undeveloped state that still provides passage for dispersing grizzly bears.

The greatest impacts or changes to secure habitat would most likely occur within the 16 percent of secure habitats in Management Area 3 and to a lesser extent in some secure habitat in Management Area 2. The secure habitat within Management Area 1 is expected to change very little under the proposed action.

Roads and motorized trails within each management area are shown in figure 44 and figure 45 below. These maps illustrate that Management areas 1 has very few roads and motorized trails, Management Area 2 has more than Management Area 1, but fewer than Management Area 3, while Management Area 3 has high amounts of road and motorized trails. This is why most of the secure habitat currently present is within Management Areas 1 and 2 while little exists in Management Area 3. The plan direction for Management Areas 1 and 2 and associated suitability plan components reinforce roadless rule regulations and the Wilderness Act restrictions that have protected, and will continue to protect, these lands from motorized uses. Suitability plan components restrict many activities associated with these management areas across broad areas of the forest as outlined in other sections below.

Table 92. The acres of area and secure habitat within each Management Area and land allocation in the Forest plan*

Management and Sub-management Areas	Acres Within Each Management and Sub-management Area	Acres of Secure Habitat Within Each Management Area and Sub-management Area
1A Designated Wilderness	1,107,131	1,094,558
1A2C: Suitable Wild and Scenic River (WSR) within Designated Wilderness	2,996	2,996
1A2E: Designated Research Natural Area (RNA) within designated wilderness	8,081	7,925
1A2F Candidate Research Natural Area within Designated Wilderness	603	603
1A2I Eligible Wild and Scenic River within Designated Wilderness Area	531	47
1AB: designated wild and scenic river within designated wilderness	19,029	17,248
1AB2E: established RNA within WSR within designated wilderness	689	689
1B – Designated Wild and Scenic River	11,336	2,257
1B2A: Idaho roadless rule area within designated wild and scenic river	24,838	6,872
1B2AE: Idaho roadless rule area within designated Research Natural Area within designated Wild and Scenic River	644	32
1BC: WSR within National Historic Landmark (NHL)	721	0
1BC2A: Idaho Roadless Rule (IRR) area within designated Wild and Scenic River and the National Historic Landmark	633	128
1C: National Historic Landmark (Lolo Trail)	25,887	1,325
1C2A: Idaho Roadless Rule area within National Historic Landmark	24,050	7,727

Management and Sub-management Areas	Acres Within Each Management and Sub-management Area	Acres of Secure Habitat Within Each Management Area and Sub-management Area
1C2AC: Suitable Wild and Scenic River within Idaho Roadless Rule area within National Historic Landmark	3,504	2,694
1C2AE: Idaho Roadless Rule area within a Designated Research Natural Area within the National Historic Landmark	74	0
1C2AG Candidate Research Natural Area within the National Historic Landmark within Idaho Roadless Rule.	130	0
1C2C: Suitable Wild and Scenic River within the National Historic Landmark	539	5
1C2E: Designated Research Natural Area within the National Historic Landmark	222	35
2A: Idaho Roadless Rule Area without any other overlapping designated or proposed areas	1,114,736	822,955
2AB: Recommended Wilderness within Idaho Roadless Rule Areas	243,773	225,094
2ABC: Suitable Wild and Scenic River within recommended wilderness and within Idaho Roadless Rule area	13,580	12,157
2ABCF: Suitable WSR within recommended wilderness within a Proposed Research Natural Area and within an Idaho Roadless Rule area	122	122
2ABE: Recommended wilderness within a Designated Research Natural Area within an Idaho Roadless Rule area	537	537
2ABF: Recommended wilderness within a proposed Research Natural Area and within an Idaho Roadless Rule area	185	185
2AC: Suitable Wild and Scenic River within an Idaho Roadless Rule area	39,788	22,307
2AE: Designated Research Natural Area within an Idaho Roadless Rule area	13,083	9,399
2AG Proposed Research Natural within Idaho Roadless Rule area	1,248	793
2AI Eligible Wild and Scenic River within Idaho Roadless Rule area	711	711
2B: Recommended wilderness without any other designation or proposed area.	13	0
2C: Suitable Wild and Scenic River Corridor without any other proposed or designated area	1,319	138
2D: Gospel Hump Multi-Purpose Area 2 lands within MA2	28,498	25,871
2E: Designated Research Natural Areas outside of any other proposed or designated areas	6,169	2,504
2G Proposed Research Natural Area outside of any other designated or proposed areas	658	345
2I Eligible Wild and Scenic River outside of any other proposed or designated area.	2,658	15
3A All Other Areas	1,182,903	166,300

Management and Sub-management Areas	Acres Within Each Management and Sub-management Area	Acres of Secure Habitat Within Each Management Area and Sub-management Area
3B Gospel Hump Multi-Purpose Area Geographic Area within Management Area 3	57,437	28,505
Subtotal 1A Lands – Designated Wilderness including those with other designated and proposed areas	1,139,059	1,124,066
Subtotal 1B Lands-Designated as Wild and Scenic Rivers outside of designated wilderness but including those with other overlapping designated or proposed areas.	38,173	9,290
Subtotal 1C Lands – National Historic Landmark including those with other overlapping designated or proposed areas	54,406	11,786
Subtotal 2A Lands – (2A through 2AI) Primary Idaho Roadless Rule Areas but includes lands with other overlapping designated or proposed areas.	1,427,763	1,094,259
Subtotal 2B through 2I- Other designated or proposed MA2 lands outside of Idaho Roadless Rule Areas.	39,316	28,875
3A- General Forest Areas	1,182,903	166,300
3B Gospel Hump Multi-Purpose Areas	57,437	28,505
Total MA1 Lands	1,231,638	1,145,141
Total MA2 Lands	1,467,078	1,123,133
Total MA3 Lands	1,240,340	194,805
Grand Total	3,939,056	2,463,080

*Management areas are indicated by the first number in the alphanumeric codes and begin with 1, 2, or 3 to indicate the Management Area. In some areas, more than one designation or proposed designation can be found and are indicated by the labels. Each unique combination of land allocation is separated out. Alphanumeric codes that start with 1A are designated Wilderness, if they start with 1B they are designated Wild and Scenic River but not wilderness, if they start with 1C they are Lolo Trail National Historic Landmark and not wilderness nor wild and scenic rivers. Alphanumeric codes that start with 2A are Idaho Roadless Rule areas and may include other overlapping designations. If they start with 2B, 2C, 2D, 2E, 2G, or 2I they are Management Area 2 lands outside of Idaho Roadless Rule Areas. Management Area 3 consists of lands with alphanumeric codes of 3A and 3B.

Table 93. The amount in acres and percentage (rounded) of secure habitat within each management area

Management Area	Total Acres of Secure Habitat	Percent Secure Habitat Within MA
Management Area 1	1,145,141	93%
Management Area 2	1,123,133	76%
Management Area 3	194,805	16%

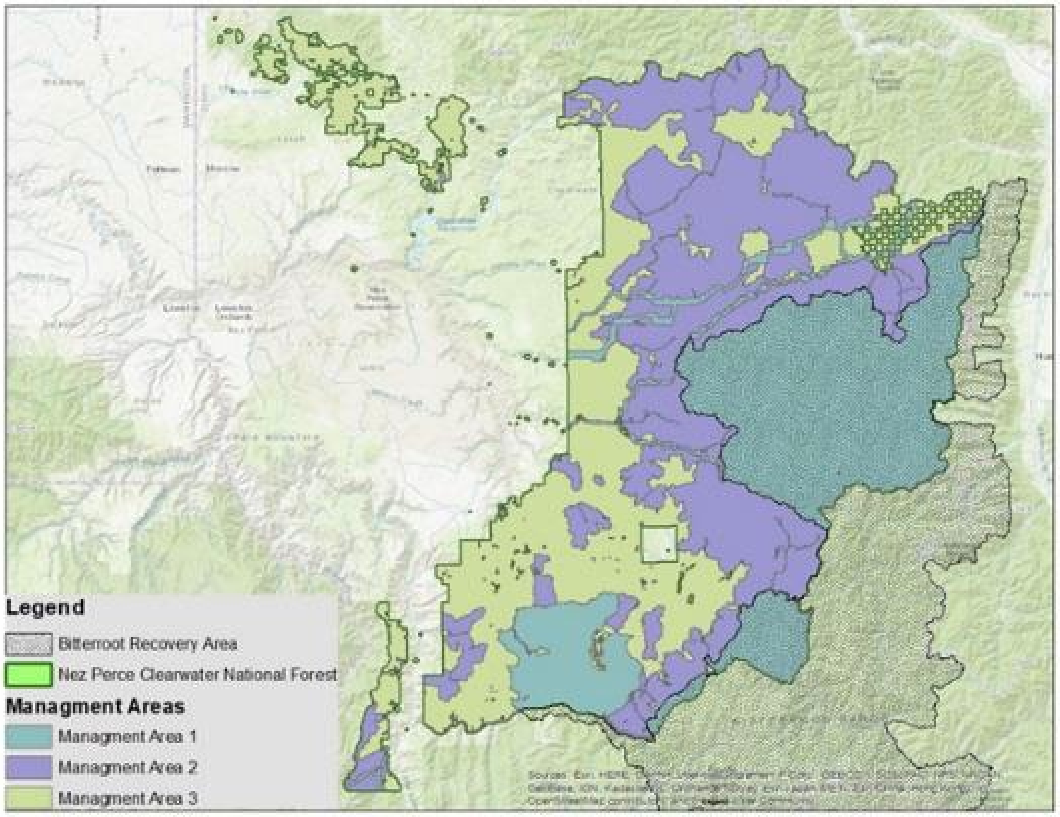


Figure 43. Management Areas under the proposed action

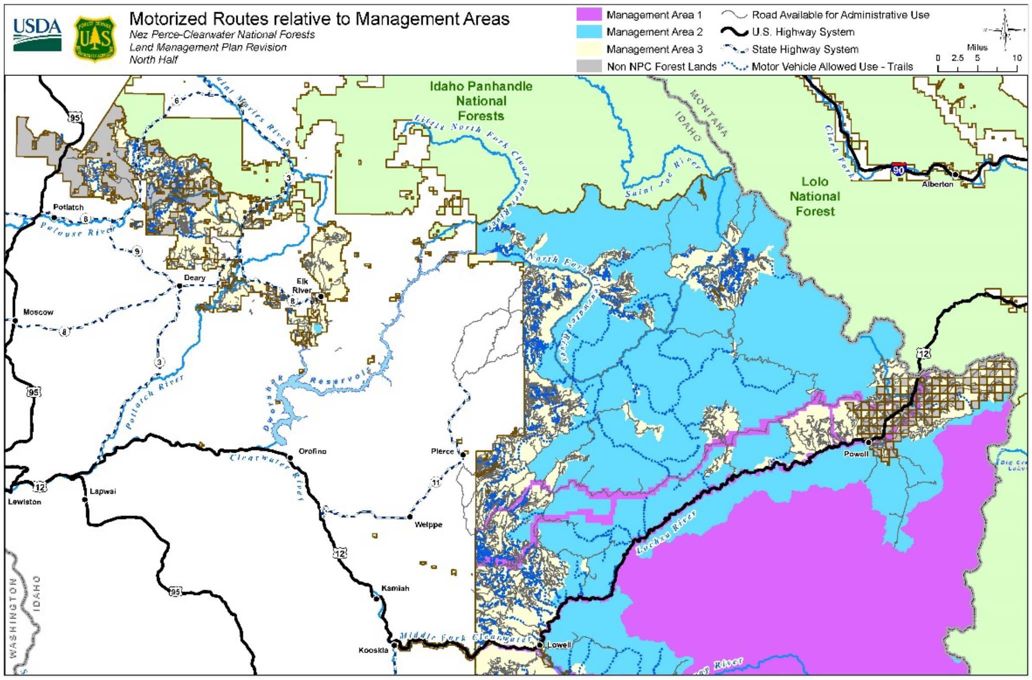


Figure 44. Current motorized roads (gray) and motorized trails (shown in dotted dark blue) in relation to the three management areas of the proposed action in the northern portion of the plan area

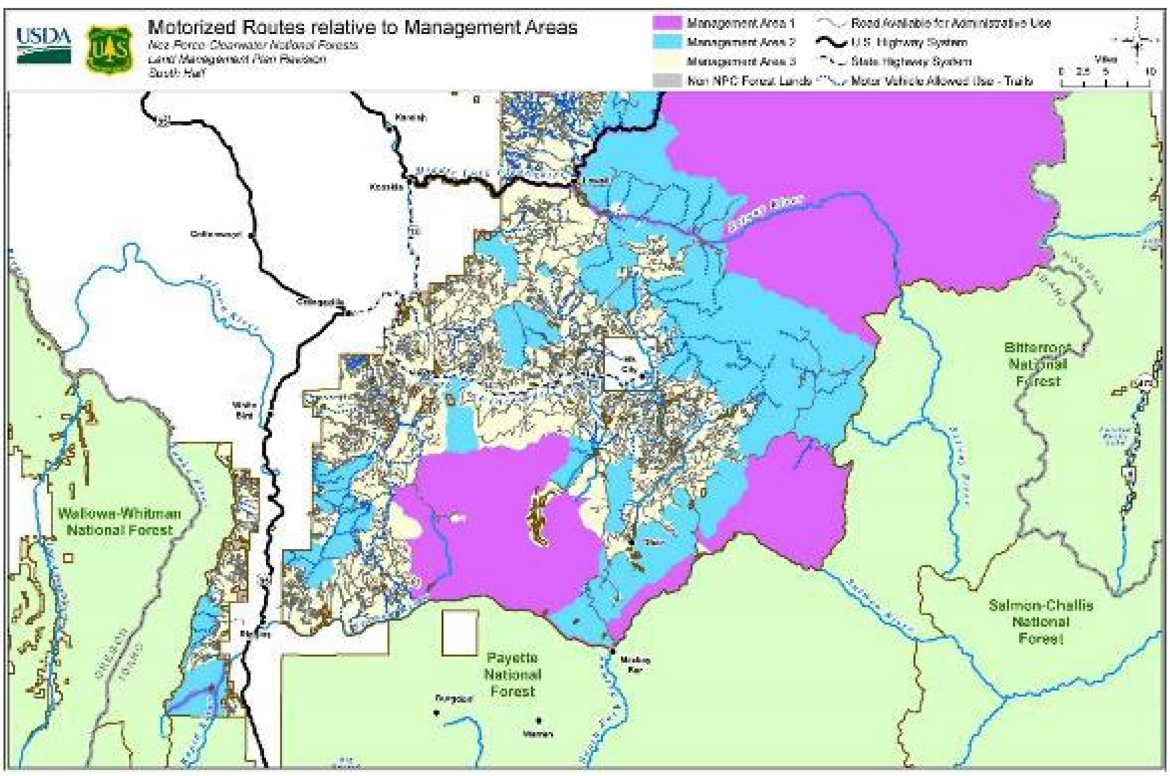


Figure 45. Current motorized roads (gray) and motorized trails (shown in dotted dark blue) in relation to the three management areas of the proposed action in the southern portion of the plan area

Effects of Suitability Plan Components

Suitability plan components are a new type of plan components introduced in the 2012 Planning Rule. They identify the appropriateness of various uses or activities within a plan area. Identifying the suitability of lands for a use in the forest plan indicates that the use may be appropriate but does not make a specific commitment to authorize that use. Where uses are identified as not suitable, the specified activity would not be allowed in those areas. Therefore, the effects of suitability plan components are programmatic in nature.

Suitability plan components are often associated with land allocations such as uses suitable within wilderness, Idaho Roadless Rule Areas, Wild and Scenic Rivers, Research Natural Areas, or areas set aside for general forest management that emphasizes multiple uses. However, they can also apply to areas such as Riparian Management Zones that are not a management area. Categories of suitability plan components include timber production, timber harvest, permanent road construction, temporary road construction, prescribed fire, livestock grazing, locatable minerals, saleable minerals, leasable minerals, new facilities, motorized uses, over-snow motorized recreation, and mechanical transport recreation travel, such as bicycling. Suitability plan components provide broad direction across the landscape for these activities. Each of these activities have the potential to affect grizzly bears.

Timber production is suitable in portions of Management Area 3. It is excluded everywhere else. Timber production is associated with increased roads, which detract from secure habitat.

Timber harvest is tree cutting for purposes other than producing lumber. This may include activities to achieve vegetation desired conditions, fuels reduction, wildlife habitat improvement, or other similar activities. It can be less impactful than production because the purpose for the treatments can differ from production which can alter the methods used. It can be conducted from existing roads but can also be associated with temporary and permanent road construction, which can alter habitat and detract from secure habitat. Timber harvest is much more widely suitable than timber production. It is suitable everywhere except wilderness, the National Historic Landmark, and Idaho Roadless Rule wildland recreation theme areas, however, other roadless rule themes place very strict rules on when timber harvest could be done and generally require Regional Forester approval.

Temporary roads are not suitable within designated wilderness, the National Historic Landmark, suitable wild and scenic rivers wild classification areas, Idaho Roadless Rule themes of wildland recreation primitive, special areas of historic or tribal significance, back country recreation themes, primitive recreation opportunity spectrum settings, semi-primitive non-motorized settings, riparian management zones, and mass movement areas. They are suitable everywhere else. Temporary roads are used for timber harvest, production, vegetation management, or other activities but are closed after operations and have short-term effects. They are generally closed to the public when in use. They are decommissioned using a variety of techniques, once operations are finished. They can increase foot travel into forested areas until they are brushed in. While the plan has no time limit identified for when temporary roads should be closed, this generally occurs immediately after operations are finished, but at most within 5 years.

Prescribed fire is suitable across the whole forest. It can change seral conditions for vegetation, but bears use a variety of forested and non-forested conditions that provide different life requirements. While prescribed fire can reduce forest cover used by bears, it can also generate nutrition as well. Effects can occur during implementation by displacing bears. Fire also increases diversity in forest structure, function, composition, and density which provides for a broad variety of other wildlife and plants that provide for bear nutrition.

Livestock grazing is suitable within allotments everywhere except developed recreation sites and administrative sites. Grizzly bears may depredate livestock, which can lead to human bear conflicts, bear removal, or death. While livestock grazing is suitable across broad areas, it is managed within allotments that are generally located where there is sufficient forage. Livestock grazing under the plan may be available on a temporary basis on transitory forage made available following the reduction in conifer overstory from fire and timber harvest. Again, only allotments existing prior to wilderness designation are allowed within designated wilderness areas such as the Selway Bitterroot, Gospel Hump and Frank Church River of No Return wilderness areas. And no new allotments would be allowed within these wilderness areas.

The three types of Mineral extraction are suitable across most of the planning area unless withdrawn. Withdrawal has occurred in designated wilderness and the National Historic Landmark and is not suitable in administrative or developed recreation sites. Some Idaho Roadless Rule themes, riparian management zones, and mass movement areas are not suitable for leasable or saleable mineral activities. The Forest Service must allow exploration and reasonable access to mining activities but may regulate surface occupancy to some extent and require plans of operation. The Forest Service has more regulatory discretion over saleable minerals. Mining can destroy habitat when surface is occupied and can produce contaminants. Mining activities may increase the probability of human-bear conflicts during operations. While suitable across wide areas, mining activities are often localized, and no large-scale commercial mining operations are present or proposed on the Forest.

Motorized recreation is well documented in scientific literature to have adverse effects on grizzly bears. Effects include displacement and decreased survival. Motorized suitability is determined by the Winter and Summer Recreation Opportunity Spectrum Settings and is also consistent with land management allocations such as Wilderness, Idaho Roadless Rule, and recommended wilderness. The revised forest plan does not make travel management decisions, instead it identifies where motorized travel is suitable. Motorized travel is not suitable in primitive and semi-primitive non-motorized settings and within recommended and designated wilderness areas under the proposed action. It is suitable in rural, roaded natural, and semi-primitive motorized settings. There are few other plan components that restrict new motorized travel. These are analyzed in detail below.

Motorized recreation usually occurs on open roads and motorized trails, though users sometimes create illegal trails by driving cross country or drive around gates and barriers on closed roads. On the Clearwater National Forest, the travel plan designated open roads and trails and changed management from an open until closed to a closed unless designated open system. On the Nez Perce National Forest, there is no travel plan that is finalized under the travel management act. Therefore, travel is open across the Nez Perce National Forest unless closed by a site-specific decision. Travel planning on the Nez Perce National Forest would occur under the direction of the Revised Forest Plan.

Over-snow winter motorized travel is not suitable within primitive and semi-primitive nonmotorized winter recreation opportunity spectrum settings and within recommended and designated wilderness. It is suitable in other settings. Because of hibernation, winter travel generally does not affect grizzly bears except for potential disturbance or when they emerge from their hibernacula. Winter recreation is analyzed in detail below.

Mechanical transport or recreation includes bicycling and the use of game carts. Mountain biking has led to bear-human conflicts and human deaths in some cases in areas occupied by grizzly bears. Mountain biking could also displace bears. Mechanized transportation of game carcasses has virtually no direct effect on grizzly bears other than it may allow hunters to transport their game from longer distances into backcountry areas. Hunting has been known to increase human-bear conflicts when hunting results in surprise encounters or while defending carcasses. Mechanized travel is not suitable in designated nor within recommended wilderness areas, but is suitable everywhere else.

Permanent road construction is suitable in management area 3 without many constraints. Within Idaho Roadless Rule Areas, permanent roads under the plan are suitable only to the extent they are allowed within the roadless rule (see summary in above describing the Idaho Roadless Rule Direction above). Permanent roads are not suitable or allowed within Recommended Wilderness only to the extent allowed under the roadless rule. These areas would be managed like Wildland Recreation and Primitive theme areas. Roads are prohibited by law in Designated wilderness areas. Within designated wild and scenic rivers roads are allowed to the extent allowed by law and enabling legislation. Permanent roads are typically disallowed within Wild River corridors but allowed within Scenic and Recreation classes of wild and scenic rivers. To summarize, roads are generally unrestricted within Management Area 3, mostly restricted within Management Area 2, and even more restricted within Management Area 1 with the exception of some classifications of wild and scenic river areas. The suitability plan components were designed to be consistent with existing laws and regulations, which supersede the plan, and is why many suitability plan components have exceptions that tier to the allowed exceptions in those areas. The plan cannot be inconsistent with those laws and regulations.

Suitability plan components are the primary mechanisms that will provide the ecological conditions for grizzly bear connectivity and recovery because they will maintain secure habitats, prevent uses across broad areas that could affect dispersing bears, and maintain conditions within the Bitterroot Recovery Zone. Several sections of the Biological Assessment analysis below detail effects from suitability associated with management area allocation including the Effects of Recommended Wilderness section, the Effects of Designated and Suitable Wild and Scenic Rivers section, the Timber Suitability, Production, Harvest, and Vegetation Restoration section, The Effects of Motorized Suitability and Summer Recreation Opportunity Spectrum section, the Effects of Winter Recreation Opportunity Spectrum section and more. Suitability plan components are found in several tables within the Revised Forest Plan, and which are included in the Appendix of the Biological assessment below.

Effects of Designated Wilderness Area Direction

The plan will not change the distribution or amount of Designated Wilderness as these areas are designated by Congress and cannot be changed by the plan. However, the plan will establish how designated wilderness areas are managed. The prevailing management direction within Designated wilderness areas in the plan are to manage these lands to maintain wilderness character, consistent with the Wilderness Act, as well as each wilderness area's enabling legislation and its specific management plan. Natural ecological processes and disturbances (e.g., succession, wildfire, avalanches, insects, and disease) are the primary forces affecting the composition, structure, and pattern of vegetation.

A number of activities are not suitable within wilderness areas (see suitability table 26 of the Forest Plan). The plan finds wilderness areas unsuitable for timber production, timber harvest, permanent road construction, temporary road construction, mineral extraction, construction of new buildings or facilities, over snow vehicle travel, motorized travel, mechanized travel and more. Because these uses are unsuitable in wilderness, these activities would not be allowed. Livestock grazing is limited to allotments existing only before designation, and allotments are mostly absent from wilderness areas (see figure 42 for the distribution of Range allotments). See suitability plan components within the Designated Wilderness Section of the plan in Appendix B. Land Management Plan (Proposed Action).

The three designated wilderness areas are a total of 1,139,059 acres in size combined. The fact that the majority of the Bitterroot Recovery Zone is within designated wilderness protects these habitats from most actions that could impact grizzly bears or their habitat. Human presence is generally by foot or horse packing and human presence is generally lower than in the other Management areas.

Under the plan, the amount of secure habitat would be expected to remain the same or change only slightly in Management Area 1. Schwartz et al. (2010a) studied grizzly bear survival in the Greater Yellowstone Ecosystem and found predicted survival was highest in wilderness, followed by national parks, multiple-use land, and nonfederal land when comparing whether there were differences in survival within different jurisdictions in univariate comparisons suggesting that these lands are capable of providing conditions for recovery.

Effects of Recommended Wilderness Allocation and Management

For dispersing grizzly bears, the amount and location of recommended wilderness may have a beneficial effect on connectivity from the other grizzly bear recovery zones. The recommended wilderness areas in the northern portion of the Nez Perce-Clearwater would contribute to connectivity for dispersing bears heading for the Bitterroot Recovery Zone from the Cabinet Yak, Selkirk or NCDE recovery zones.

The existing condition includes recommended wildernesses as described in the 1987 Clearwater Forest Plan and includes 197,693 acres. Recommended wilderness under the 1987 forest plan contributes to grizzly bear connectivity which includes the Hoodoo, Mallard-Larkins, and portions of North Fork Spruce-White Sand and Sneakfoot Meadows. The proposed action retains the Mallard Larkin and Hoodoo area albeit with modified boundaries and drops the North Fork Spruce-White Sands and Sneakfoot Meadows. It includes a newly created Meadow Creek Recommended Wilderness Area, which would be a new Recommended Wilderness Area compared to the previous plan and is located adjacent to the Bitterroot Recovery Zone (figure 46). The modified boundaries of the Hoodoo recommended wilderness area included both additions and a few areas that won't be recommended wilderness in the proposed action. The overall results is a reduction in area of that recommended wilderness of about 3,712 acres (see table 94), however it also resulted in slightly more secure habitat of about 5,401 acres being included in recommended wilderness because of the additions (see table 95). Note that the 3,712 acres will remain unsuitable for summer motorized uses but will be suitable for winter motorized uses. The change in the boundaries of the Mallard Larkin recommended wilderness area results in an increase of about 10,762 acres in that recommended wilderness area (See table 94). The addition of the Meadow Creek recommended wilderness area adds additional new recommended wilderness. The total amount in the proposed action increases to 258,210 acres (table 94), an increase of about 60,517 acres. The beneficial effects of this would be to ensure additional area of secure habitat adjacent to the Bitterroot Recovery Zone. The Hoodoo and Mallard Larkin areas would contribute to opportunities for bears to travel from the north into the Bitterroot Recovery Zone and land within a recommended wilderness area. Bears coming from the North or East could arrive within these recommended wilderness areas, providing a gateway into the plan area.

The extent to which recommended wilderness improves or maintains ecological conditions for grizzly bear use and connectivity over Idaho Roadless Rule management depends upon suitability of uses allowed, plan direction for recommended wilderness and, and the roadless rule theme. The wildland recreation theme is the most restrictive while the Primitive theme is slightly less restrictive, and the Backcountry Restoration Theme is the least restrictive. A description of activities allowed and prohibited within roadless rule themes is presented above in the "Other Management Direction" section describing Idaho Roadless Rule direction.

Under the Idaho Roadless Rule, the Hoodoo area is managed as Wildland Recreation Theme, and most of the Mallard Larkin is managed Wildland Recreation but a small portion is managed as Primitive theme. The third, the Meadow Creek Area, is managed as Idaho Roadless Rule Area in part under the Primitive theme and in part and under the Backcountry Restoration them. It is foreseeable that the roadless rule may be amended through the rule making process to align recommended wilderness with the Wildland Recreation theme, however, that process would be outside of revision. Generally, speaking recommended wilderness management is only slightly more restrictive than Idaho Roadless Rule Themes. One primary change that would most affect grizzly bears is the use of summer motorized travel which is restricted in recommended wilderness. Though road building is also restricted within the Idaho Roadless Rule area management, motorized trails are allowed. Under the preferred alternative, motorized travel, mechanized travel, motorized and mechanized tools for public use, aircraft landing for recreational use are prohibited in recommended wilderness. Motorized and mechanized tools may be used administratively and aircraft landing for administrative uses would be allowed. Within the Idaho Roadless Rule areas in the Wildland Recreation Theme, the cutting, sale, or removal of timber is prohibited, except for personal or administrative use, as provided for in 36 CFR Part 223 or where incidental to the implementation of a management activity not otherwise prohibited by the Idaho Roadless Rule.

Areas that were formerly recommended wilderness, and that will no longer be recommended wilderness such as the areas formerly in the Hoodoo recommended wilderness area, will still be managed as Idaho Roadless rule areas within the Wildland recreation theme. MA2-SUIT-IRA-03 specifies that roads are suitable in these areas only under strict conditions specified in the Idaho Roadless Rule. Furthermore, these areas are mapped as Semi-Primitive Non-motorized in the Summer Recreation Opportunity Spectrum settings so summer motorized uses would not be suitable in these formerly recommended wilderness areas. The primary difference between recommended wilderness and Idaho Roadless Rule wildland recreation theme areas is suitability of winter motorized uses wherein some formerly recommended wilderness areas would be suitable for winter motorized uses where they are mapped as semi-primitive motorized for winter ROS. Specific effects from this change are that future potential grizzly bear dens may be disturbed by winter recreation in limited circumstances. Furthermore, allowing winter motorized access in these areas potentially increases the chance of illegal winter motorized uses in adjacent recommended wilderness by the public. However, the public use of adjacent recommended wilderness areas these areas is not authorized and restrictions on this illegal use will be reduced through law enforcement. More details on the effects of winter motorized uses are included in the section on the Effects of Winter Recreation Opportunity Spectrum and Suitability.

The primitive theme includes very limited permissions and exceptions for timber cutting, sale or removal, road construction or reconstruction, and mineral activities. Exceptions include: to improve threatened, endangered, proposed, or sensitive species habitat; to maintain or restore the characteristics of ecosystem composition, structure, and processes; and to reduce the risk of uncharacteristic wildland fire effects to an at-risk community or municipal water supply system. Management is primarily to maintain roadless characteristics.

The Backcountry Restoration theme allows limited permissions and exceptions for timber cutting, sale, or removal; road construction and reconstruction; and mineral activities. This includes the following exceptions: to reduce hazardous fuel conditions within or outside of a community protection zone with conditions; to reduce the risk of uncharacteristic wildland fire effects; to improve threatened, endangered, proposed, or sensitive species habitat; and to maintain or restore the characteristics of ecosystem composition, structure, and processes.

Table 95 shows the amount of secure habitat in the existing condition compared to the proposed action within recommended wilderness areas. The proposed action would add additional secure habitat of about 50,088 acres that will be protected by recommended wilderness compared to the existing condition. It should be noted that the areas that were previously recommended wilderness would still be secure habitat even if it’s not recommended wilderness. Future management of these former recommended wilderness areas would be determined by their new management area direction and because they are also Idaho Roadless Rule areas, road construction, as well as other restricted activities, would continue to be prohibited by regulation. They would retain the most restrictive Idaho Roadless Rule Wildland Recreation Theme. The proposed action for recommended wilderness provides protections to maintain areas of potential dispersal in the Hoodoo and Mallard-Larkin for bears arriving from the North or East, and the Meadow Creek for bears moving south-east as they spread through the Bitterroot Recovery Zone. The proposed action would add 60,517 total acres and 50,088 acres of secure habitat to recommended wilderness.

An important note is that about 85.4 miles of existing roads or motorized trails will be unsuitable as a result of the change in recommended wilderness in the proposed action and will need to be closed in a future travel management decision as a result of the change. This will result in additional secure habitat once this happens. Also, about 80.9 miles of trail open to mechanical travel, such as bicycles, will also be unsuitable as a result of the change in recommended wilderness under the proposed action.

Table 94. The acres of recommended wilderness in the existing condition compared to the proposed action

Recommended Wilderness (2B)	Existing Condition	Proposed Action
Hoodoo	111988	108276
Mallard-Larkins	66377	77139
Sneakfoot Meadows	9465	0
North Fork Spruces White Sands	9865	0
Meadow Creek	0	72795
Grand Total	197695	258210

Table 95. The acres of secure habitat by recommended wilderness area for the proposed action compared to existing conditions

Recommended Wilderness Area	Existing Condition	Proposed Action
Hoodoo	107824	102423
Mallard-Larkins	64302	72250
Meadow Creek	Still secure habitat but not in recommended wilderness	63422
North Fork Spruce - White Sand	8003	Still secure habitat but not in recommended wilderness
Sneakfoot Meadows	7886	Still secure habitat but not in recommended wilderness
Total	188,015	238,095

Table 96. The proposed uses allowed in recommended wilderness

Proposed Activities in Recommended Wilderness Areas	Existing Condition	Preferred Alternative
Motorized Travel	No	No
Mechanized Travel	No	No
Motorized and mechanized tools for public use	No	No
Motorized and mechanized tools for administrative use	Yes	Yes
Aircraft landing for recreational use	No	No
Aircraft landing for administrative use	Yes	Yes

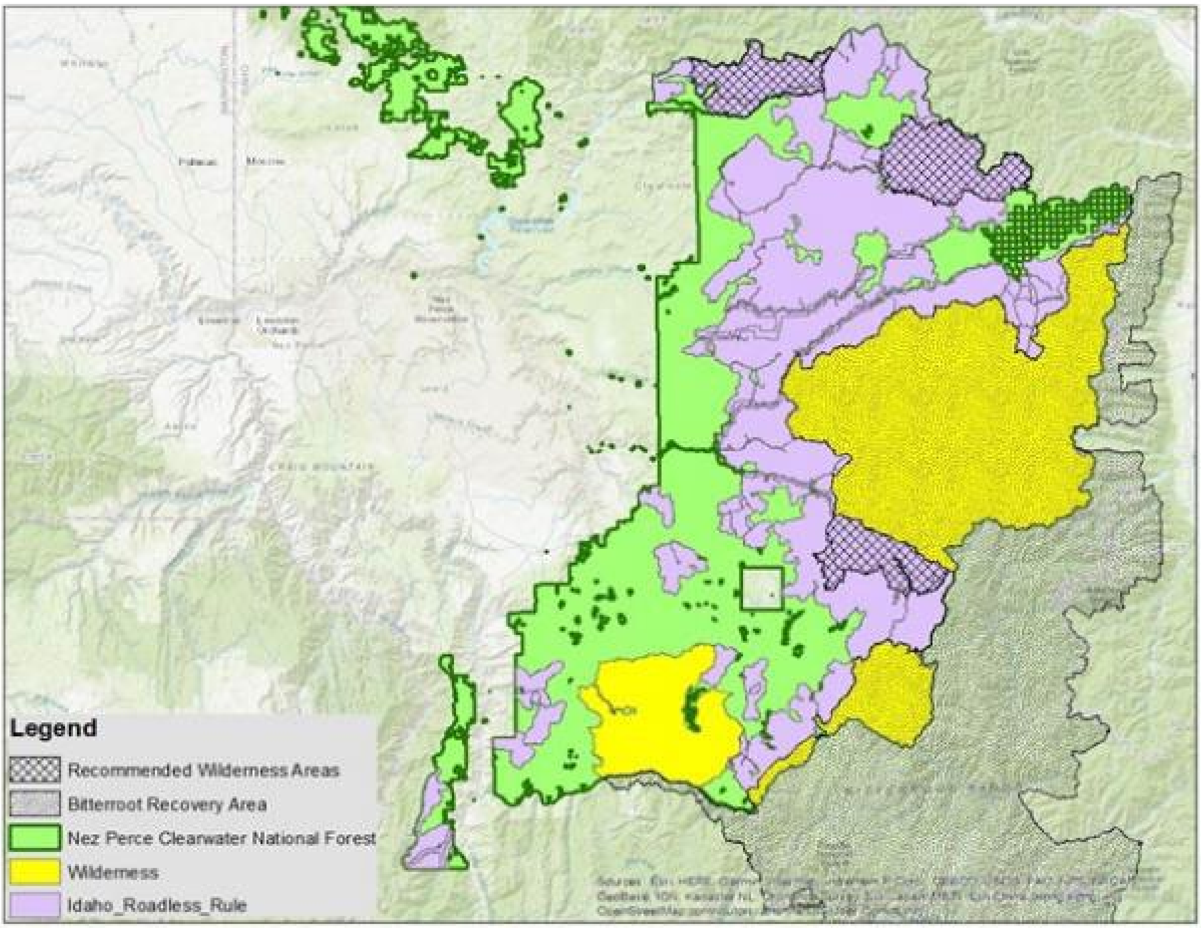


Figure 46. The location of recommended wilderness areas in relation to Idaho Roadless Rule Areas, and designated wilderness areas, and the Bitterroot Recovery Zone

Effects of Designated Wild and Scenic Rivers Management

The acres of designated wild and scenic river corridors and the acres of secure habitat contained within those corridors are shown in table 97. These areas will not change under the plan and are already established by congress, but their management would be determined in the plan and would be consistent with applicable regulations.

Additional management direction is also provided in Wild and Scenic River Plans. Wild and Scenic River management plans are documents established either after designation that provide additional guidance to manage the river and its corridor. Wild and Scenic River plans typically consist of direction to protect outstandingly remarkable values of the river. The Wild and Scenic River plans will still be in effect when the revised forest plan is completed but could be revised under the guidance of the Revised Forest Plan in the future. Wild and Scenic Rivers are managed to maintain their free-flowing character, water quality and outstandingly remarkable values for which the river was designated. This management is generally beneficial to grizzly bears and would serve to maintain grizzly bear habitat because of the restrictive nature of wild and scenic river management. Also see analysis of suitability for restrictions and allowances in the plan in wild and scenic rivers. The plan includes components specific to designated Wild and Scenic Rivers under direction for Management Area 1, and through suitability of uses included in table 28 of the revised forest plan. Allowed activities varies whether a river is identified as wild, scenic, or recreational, with wild rivers restricting more activities than scenic and recreational rivers. Wild and scenic river management contributes to populations of anadromous fish which could serve as a food source for grizzly bears. The plan components and their effects are discussed specifically in the section called "Plan Direction that Contributes to Grizzly Bear Recovery".

Table 97. Acres of Secure Habitat within existing Designated Wild and Scenic Rivers

Designated Wild and Scenic River	Total Acres	Acres of Secure Habitat
Middle Fork Clearwater, Idaho	44,383	14,685
Rapid, Idaho	4,341	4,227
Saint Joe, Idaho	2	2
Salmon, Idaho	9164	8,313
Totals	57,890	27,227

FSH 1909.12 outlines the activities allowed within the different wild and scenic river classifications. Wild rivers restrict timber cutting, new mineral leases, roads, motorized travel and allows only minimal recreation developments. Management of Designated wild and scenic rivers would generally have beneficial effects on grizzly bears. However, some activities that could affect grizzly bears could occur in some classes of wild and scenic rivers. For example, the plan would find the following use suitable: permanent road construction, construction of new buildings, minerals, motorized travel, or other uses. However, some activities that could affect grizzly bears could occur in some classes of wild and scenic rivers. For example, the plan would find the following uses suitable in some classifications: permanent road construction, construction of new buildings, minerals, motorized travel, or other uses (see suitability table within the Designated Wild and Scenic River Section of the Plan included in the appendix). These activities would require site specific project analysis before being undertaken. Management of designated wild and scenic rivers protects the outstandingly remarkable values for which they were designated and maintains their free flow characteristics which are protective of riparian habitat for grizzly bears. Some designated Wild and Scenic River corridors overlap other land allocations such as designated wilderness, and the National Historic Landmark, research natural areas and Idaho Roadless Rule Areas. In these cases, all direction for the different land management allocations would apply. Overlap occurs on 46,544 acres of which 24,969 acres are secure habitat. About 11,336 acres are only designated wild and scenic river without any other overlapping land allocation and has 2,257 acres secure habitat. Designated Wild and Scenic Rivers contribute to protections of secure habitat and connectivity.

Effects of Direction within the National Historic Landmark

The Lolo Trail, a National Historic Landmark, administered in cooperation with the National Park Service, is part of the Nez Perce National Historical Park. It includes the trail and lands surrounding the trail. The trail consists of the remnants of the original trails used by indigenous peoples and Lewis and Clark, but also the Lolo Motorway which is a road that follows parts of the original trail. The plan will not change the national historic landmark because it was designated by congress, but it will set direction for the management of the landmark. The National Historic Landmark was set aside in the plan as Management Area 1 lands and have protective land management plan components associated with it. It is also designated as Idaho Roadless Rule Areas and is managed under the Special Areas of Historic and Tribal Significance theme. Therefore, all restrictions under that theme in the Idaho Roadless Rule would apply as well as any plan components. While it is limited in size and is a long narrow feature on the landscape, it will contribute to the conservation of ecological conditions for grizzly bears.

The prevailing management direction in the plan is that the landmark is managed so that the National Register integrity of the Lolo Trail National Historic Landmark is considered *high.* Natural processes are the primary drivers of change to, and composition of, vegetative communities. The plan contains a desired condition that roads and trails persist in a manner that do not detract from the National Register integrity of the landmark while providing for reasonably safe passage by the public consistent with designated uses. Another desired condition for these lands is that non-system roads are not present. Standard GA-STD-NHL-01 establishes that trees shall only be felled within the landmark corridor if they pose a hazard or safety threat. All other tree felling is prohibited. Guideline GA-GDL-NHL-05 establishes that new temporary or permanent road and trail construction should not be permitted within the Landmark unless the integrity of the National Historic Landmark is maintained, and the purpose of the action is to benefit the National Register integrity of the Landmark. This guideline only allows new motorized roads and trails when these conditions are met, which would be infrequent if at all.

The plan is explicit about actions that are and are not suitable within the Landmark. The suitability of management actions within the National Historic Landmark are shown in the table below. The National Historic Landmark is relatively small, consisting of 55,760, but the plan's direction would help these lands contribute to grizzly bear habitat. See the Suitability table in the National Historic Landmark section of the plan included in Appendix B. Land Management Plan (Proposed Action).

Effects of Idaho Roadless Rule Direction

The Idaho Roadless Rule areas are primarily managed under Management Area 2 and have area specific plan components that apply to these lands. There are 34 separate mapped Idaho Roadless Rule areas that vary greatly in size, elevation, and habitat. In total, the Idaho Roadless Areas comprise approximately 1,481,565 acres across the Nez Perce-Clearwater. Note that some Idaho Roadless Rule Areas are in Management Area 1 because they overlap with the National Historic Landmark, and some designated wild and scenic river corridors, and so the total amount of Idaho Roadless Rule Area is larger than Management Area 2.

Each Idaho Roadless Rule area is assigned one or more management themes as outlined in the Idaho Roadless Rule. The Idaho Roadless Rule themes assign various permissions and prohibitions regarding road building, timber cutting, and discretionary mineral activities.

The Revised Forest Plan specifies that Idaho Roadless Rule areas in the plan are managed in a manner that is consistent with the appropriate theme, as defined by the final rule outlined in 36 CFR Part 294 (Special Areas; Roadless Area Conservation; Applicability to the National Forests in Idaho; Final Rule). Each theme specifies permitted and prohibited actions for timber cutting, roads, and minerals. A summary of permitted and prohibited actions in Idaho Roadless Rule Areas is summarized in above. Idaho Roadless Rule areas contribute greatly to the conservation of habitats that can contribute to grizzly bear recovery and connectivity. The plan will not change the boundaries nor the themes of the Idaho Roadless Rule areas as these were established and codified in the Idaho Roadless rule. The revised forest plan will however, set direction for the management of these areas and this direction was explicitly designed to be consistent with the prohibition and permitted activities specified by the Idaho Roadless Rule within their respective themes. The acres of area and secure habitats of the different Idaho Roadless Rule themes are shown in table 98.

Desired conditions for Idaho Roadless Rule Areas emphasis maintaining the roadless characteristics and themes assigned to them in the Idaho Roadless Rule. The desired conditions specify that the composition, structure, and pattern of vegetation reflect natural disturbances and follow Idaho Roadless Rule themes, as assigned. The plan has specific desired conditions for Roadless areas to contribute to habitats for wide ranging species and connectivity for movement of wildlife and also that these areas provide foraging, security, denning, and nesting habitat for wildlife. The plan's desired conditions also state that Roadless areas provide recreational opportunities for both motorized and non-motorized users all year long and is reflected in the appropriate recreation opportunity spectrum classes of primitive, semi-primitive non-motorized, and semi-primitive motorized opportunities. These desired conditions provide the prevailing direction towards which management of Idaho Roadless Rule lands are directed. The Idaho Roadless Rule defines Roadless characteristics as:

- Resources or features that are often present in and characterize Idaho Roadless Areas, including:
- High-quality or undisturbed soil, water, or air
- Sources of public drinking water
- Diversity of plant and animal communities
- Habitat for threatened, endangered, proposed, candidate, and sensitive species and for species dependent on large, undisturbed areas of land
- Primitive, semi-primitive nonmotorized, and semi-primitive motorized classes of dispersed recreation
- Reference landscapes
- Natural appearing landscapes with high scenic quality
- Traditional cultural properties and sacred sites
- Other locally identified unique characteristics

One standard and a set of suitability plan components provide the restrictions within Idaho Roadless Rule lands. Standard MA2-STD-IRA-01 states "The provisions in the Idaho Roadless Rule (36 CFR 294 Subpart C) shall take precedence over any inconsistent land management plan component unless and until the rule is amended. Land management plan components that are not inconsistent with the Idaho Roadless Rule will continue to provide guidance for projects and activities within Idaho Roadless Areas and those related to protection of threatened and endangered species (36 CFR 294.28(d))." This direction enforces the prohibitions and allowances of the Idaho Roadless rule as codified and will maintain ecological conditions for grizzly bear dispersal and occupancy because they will constrain a variety of activities within these areas that could affect grizzly bear habitat or increase the probability of human-bear conflicts.

Suitability plan components that determine which actions are and are not suitable in Idaho Roadless Rule areas are outlined in the Idaho Roadless Rule Section of the revised forest plan in table 35 included in the appendix to the BA. A broad range of actions are prohibited or allowed by suitability plan components and are consistent with Idaho Roadless Rule prohibitions and permissions within the themes. The prohibitions or allowances are tiered to the Idaho Roadless Rule themes as outlined in the footnotes and in the table below. A map of the Idaho Roadless Rule themes is provided in figure 5 and a summary of restrictions and allowances in the Idaho Roadless Rule by theme are provided in table 23 (see Other Management Direction -Idaho Roadless Rule). These suitability plan components will protect these lands from actions that could impact secure habitat or create conditions that have the potential to increase the probability of human bear conflicts. Actions constrained by suitability plan components and the Idaho Roadless Rule include timber production, timber harvest, permanent road construction, temporary road construction, mineral materials, construction of new buildings, and motorized travel, though exceptions are allowed in some areas depending upon theme. Note that community protection zones within Idaho Roadless Rule areas allow temporary roads which includes about 36,200 acres (2.4% of land within an Idaho Roadless Area on the Forest).

The different themes provide different sets of restrictions which result in some variation in the level of protection the Idaho Roadless Rule and associated plan direction offers. The different themes offer different levels of restrictions and allowances that provides variation in the degree of protections that they offer. The “Other Management Direction” above provides a summary of the different protections and allowances found in the Idaho Roadless Rule, however the full suite of activities can be found in the Roadless Rule itself (36 CFR 294.28(d)).

The U.S Forest Service consulted on the effects of the Idaho Roadless Rule on federally listed species, including on grizzly bears. In 2008, the U.S. Fish and Wildlife Service Issued a biological opinion on the effects of the Idaho Roadless Rule on federally listed species including grizzly bears (U.S. Department of the Interior 2008). The biological opinion evaluated the effects of activities that could be allowed as a result of the Rule and evaluated the effects on grizzly bears from the suite of permissible and prohibited actions including timber harvest, sale, or removal; road construction and reconstruction; and mineral activities. It also evaluated helicopter logging, fire, fire suppression and prescribed fire. It concluded that as the Bitterroot Recovery Zone was currently unoccupied, the Idaho Roadless Rule will have no effect on the status of the Bitterroot Recovery Zone.

As mentioned above, the Idaho Roadless rule contributes to secure habitats for grizzly bears. The amount of area and the amount of secure habitat by theme is shown in the table below. Many of these areas were maintained without roads by elk habitat effectiveness objectives direction in the 1987 forest plans, they were maintained thereafter by the 2001 National Roadless Area Conservation Rule (36 CFR Part 294 Special Areas; Roadless Area Conservation; Final Rule), and since 2008 by the Idaho Roadless Rule. This management history has served to conserve these lands and the Idaho Roadless Rule and Revised Forest Plan Direction will continue that trend into the future.

Table 98. The total acres, acres of secure habitat, and percent secure habitat within Idaho Roadless Rule Themes

Idaho Roadless Rule Area Theme	Acres with the Plan Area	Acres of Secure Habitat Within Each Theme	Percent Secure Habitat
Backcountry Restoration	835,649	588,705	70.4
Primitive	311,154	254,227	81.7
Forest Plan Special Areas	38,287	16,025	41.9
Special Areas of Historic or Tribal Significance	49,341	24,432	49.5
Wildland Recreation	247,133	228,251	92.4
Totals	1,481,565	1,111,642	75

A number of other land allocations overlap Idaho Roadless Rule Areas, providing additional guidance and restrictions above those required by the Idaho Roadless Rule. They include the National Historic Landmark, Recommended Wilderness Areas, some designated wild and scenic river corridors, some of the suitable and eligible wild and scenic river corridors, some designated and proposed research natural areas. For example, there are some lands that are both Idaho Roadless Rule and Designated Wild and Scenic River. In some cases, there are more than two land designations. In cases where there are overlapping land management allocations, actions would have to follow Idaho Roadless Rule direction and the direction for any overlapping land allocations. The plan specifies that the more restrictive direction would prevail in cases where there is conflict. Similarly, the plan specifies that where the plan is inconsistent with the Idaho Roadless rule, direction in the rule prevails. The lands that have overlapping land allocations are further protected and would contribute to conservation of secure habitat and connectivity. These areas overlap Idaho Roadless Rule Areas and provide additional protections on about

366,900 acres or about 24.8 percent of Idaho Roadless Rule lands. Overlapping areas contain about 288,758 acres of secure habitat.

Most of the Idaho Roadless Rule Areas are managed under Management Area 2 direction, but there is also Idaho Roadless Rule areas within Management Area 1 because of overlapping designations such as the National Historic Landmark and Designated Wild and Scenic Rivers which are both under Management Area 1. In some cases, more than two land designations occur. For example, there are places that are Idaho Roadless Rule areas, designated wild and scenic river, and a research natural area (table 92). The additional designations and land allocations that overlap Idaho Roadless Rule Areas are shown in table 99. Designated wilderness areas do not overlap with Idaho Roadless Rule Areas.

Table 99. The acres of Idaho Roadless Rule Areas overlapped by other land area allocations or designations

Designation or Allocations	Acres
Designated Wild and Scenic River Corridor	26,115
Suitable Wild and Scenic River Corridor	53,490
Designated National Historic Landmark	28,391
Designated Research Natural Area	14,338
Proposed or Candidate Research Natural Areas	1,685
Eligible Wild and Scenic River Corridor	711
Recommended Wilderness	258,197

Note that because some areas have more than two overlapping management areas, the area of protection is less than the total overlapping acres

Plan direction for Idaho Roadless Rule areas constrain activities that could impact secure habitat and will provide the ecological conditions to provide connectivity. Additional analysis about effects of various land allocations related to the Idaho Roadless Rule Areas can be found in the Effects of Management Area Allocation and Direction, Effects of Suitability Plan Components, Effects of Recommended Wilderness Allocation and Management, Effects of Proposed and Designated Research Natural Areas, Timber Suitability, Production, Harvest, and Vegetation Restoration; Effects of Motorized Suitability and Summer Recreation Opportunity Spectrum, Effects of Recreation, Dispersed and Developed Site, Trails and Special Uses; Effects of Minerals and Energy, and How the Plan Addresses Motorized Access sections.

Eligible and Suitable Wild and Scenic Rivers

In the 1987 forest plans, rivers were identified as eligible based on their outstandingly remarkable values and management direction is to maintain those values until congressional designation. Forest Service policy requires the protection of the outstandingly remarkable values within a ¼ mile distance from the river called the river corridor. A decision made while revising a Forest Plan is whether other rivers would be identified as suitable or eligible to be considered for future wild and scenic river designation. Grizzly bears are not identified as outstandingly remarkable values for any river identified in the proposed action because they were not identified as river dependent species.

Under the proposed action, rivers were identified as eligible based on a new evaluation of outstandingly Remarkable Values and then, in the final decision, would be determined to be suitable for congressional designation based on a variety of factors. Therefore, the plan changes whether rivers with outstandingly remarkable values are suitable for wild and scenic designation or remain eligible. The acres of secure habitat within eligible or suitable wild and scenic river in the existing condition and the proposed action are shown in table 104. The existing condition has many eligible rivers and none that are suitable, while the proposed action identifies some as suitable. The acres of secure habitat within eligible or suitable wild and scenic river in the existing condition and the proposed action are shown in table 104.

The revised forest plan will set management direction for suitable rivers and their corridors, through plan components and suitability of uses. Like designated wild and scenic rivers, eligible and suitable wild and scenic rivers are classified as either wild, recreational, or scenic and are managed accordingly. Effects of plan components and suitability of uses are included in table 105 and table 106. The management of these rivers is to maintain their free-flowing characteristics and outstandingly remarkable values until a designation decision is reached by congress.

The plan components for suitable or eligible wild and scenic rivers are found in direction for Management Area 2 in the revised forest plan. The plan components emphasize retaining free-flowing condition, preliminary classification, and the outstandingly remarkable values. MA2-STD-E&SWSR-01 prohibits actions that would change their classification. Other plan direction emphasizes maintain their scenic character.

Activities are also restricted by suitability of uses based on their classification. The plan identifies suitability of uses for Eligible and Suitable wild and scenic rivers which are shown in table 32 of the revised forest plan. Some wild and scenic river classifications restrict actions like road and trail building within the ¼ mile river corridor. Restrictions in suitability of uses would help maintain grizzly bear habitat and habitat security. The amount of secure habitat within each of the eligible and suitable wild and scenic river classification types are shown in table 102 and table 103. The existing condition has the most acres within the wild classification compared to the proposed action.

Forest Service Handbook (FSH) 1909.12 outlines the activities allowed within the different wild and scenic river classifications. Wild rivers restrict timber cutting, new mineral leases, roads, motorized travel and allows only minimal recreation developments. Scenic Rivers allow timber activities provided there is no substantial impact on the river and its immediate environment but with an emphasis in maintaining visual quality. Mineral operations must minimize surface disturbance, sediment and pollution, and visual impairment. Roads may occasionally bridge the river and short stretches of screened roads may be permitted. Public use facilities are permitted within the river corridor if screened from the river. Motorized travel may be permitted, restricted, or prohibited to protect river values. For recreational rivers timber harvest is permitted but the immediate river environment will be protected and emphasizes maintaining visual quality. New mining claims and new mineral leases must minimize surface disturbance, sedimentation, pollution, and visual impairments. Paralleling roads may be constructed along the river, and there may be several bridges and access points to the river. Campgrounds and recreational facilities may be established. Motorized travel may be permitted, restricted, or prohibited to protect river values. These measures afford some levels of protection for the rivers and may benefit grizzly bears.

Eligible and suitable wild and scenic river management would generally indirectly benefit grizzly bears. Suitable wild and scenic rivers would also provide some benefits to grizzly bear connectivity especially certain rivers that lie between the northern boundary of the forest and the Bitterroot Recovery Zone. The proposed action identified 10 rivers as suitable for wild and scenic consideration. Suitable rivers under the proposed action are shown in the introduction of the BA in table 2. Most of these rivers are found within roadless rule, recommended wilderness or designated wilderness and would already be relatively protected by that management. Where land allocations overlap, all plan components would apply, and eligible and suitable wild and scenic river management would add additional protections to these lands. While the total acres of suitable wild and scenic rivers are relatively modest, they will provide some measures for the conservation of secure habitat and contribute to connectivity. This is especially true within the Wild classification which is the most restrictive in terms of suitability plan components and actions that affect secure habitat.

Where land allocations overlap, all plan components would apply, and eligible and suitable wild and scenic river management would add additional protections to these lands. For example, an area might be suitable wild and scenic river and fall within designated wilderness areas. Therefore, plan components guiding management in both areas would apply. The overlap in land allocations of suitable wild and scenic rivers is shown in table 92. While the total acres of suitable wild and scenic rivers are relatively modest, they will provide some measures for the conservation of secure habitat and contribute to connectivity. This is especially true within the Wild classification which is the most restrictive in terms of suitability plan components and actions that affect secure habitat (see table 32 in the Forest Plan). Wherever they occur, all plan components would apply, and eligible and suitable wild and scenic river management would add additional protections to these lands.

There will be new additions that would be found suitable for inclusion into the wild and scenic river system via suitability (see Eligible and Suitable Wild and Scenic River. These will add a total of 5,247 acres of secure habitat within the wild and scenic river system. The new rivers include the Middle Fork Kelley Creek, North Fork Kelly Creek and South Fork Kelly Creek are in the Northern portion of the plan area which could contribute habitat for dispersing bears coming from the north.

Some rivers that are eligible under the 1987 forest plans will no longer be eligible as Wild and Scenic Rivers and would no longer be managed as wild and scenic rivers. Once a suitability determination is made, management to maintain outstandingly remarkable values on eligible rivers is no longer required. Therefore, the proposed action will result in fewer rivers being managed as eligible for Wild and scenic rivers. In this case, the river corridors would revert to being managed within the land allocation or management area within which they are located. For example, river corridors located within Management Area 3 would be managed for multiple uses. River corridors located in Idaho Roadless Rule areas would be managed consistent with management area 2 direct and direct for the Idaho Roadless Rule. Similarly, rivers within designated wilderness would be managed consistent with wilderness and management area 1. Most of the rivers that were eligible in the 1987 forest plans are located within designated wilderness areas or Idaho Roadless Rule areas as shown in Table 106. In the proposed action, 21 formerly eligible rivers would no longer be managed as eligible rivers managed to protect outstandingly remarkable values and free flow characteristics. Fifteen of these rivers are located within designated wilderness, recommended wilderness, while six river corridors would be located within Idaho Roadless Rule area or MA3 multiple uses areas.

Those 15 which fall within designated wilderness, recommended wilderness would have low potential for impacts because plan components for management area direction would constrain most management that could affect river corridors and these would not be suitable for motorized uses. So, they would not be at risk for loss of secure habitat or alteration of free-flowing characteristics. Within these rivers, little would be impacted. Technically speaking wilderness areas do not prohibit building of dams but in reality, dams are highly unlikely in wilderness areas even though they are not expressly prohibited. While there would be a change in management, it would result in little direct impact to secure habitat or grizzly bears because most of it would remain in areas not suitable for motorized uses.

Six river corridors no longer eligible are located within Idaho Roadless Rule areas, or within MA3 managed for multiple uses. These rivers have the potential to have free flow characteristics altered or would no longer protect their outstandingly remarkable values as a result of agency actions. The total amount of secure habitat within these six rivers is 12,172 acres. However, four of these rivers have river corridors located within both wilderness areas and Management Areas 2 or 3. These include John’s Creek, Lake Creek, Slate Creek and West Fork Gedney Creek. Therefore, parts of these rivers are protected with those portions falling within wilderness, recommended wilderness or areas not suitable for motorized uses. Some sections of these rivers could have future projects that might result in a loss of secure habitat, but most of the areas within MA3 are not secure habitat. There are two large rivers that will not be suitable as Wild and Scenic rivers. These include the North Fork of the Clearwater and the South Fork of the Clearwater. While these rivers have more acres of river corridor, they currently have little existing secure habitat with 67 acres within the North Fork and 3 acres within the South Fork. Free flowing characteristics would no longer be emphasized on these rivers. While the changes would result in less protective management of the rivers, the rivers themselves will still be managed as important resources, with protections from plan components such as those in the Aquatic Ecosystems section of the plan. Essentially, this change will not result in many future activities that could be impactful to secure habitats. For the actions that are and are not suitable within eligible and suitable wild and scenic rivers see the Eligible and Suitable Wild and Scenic River section in the revised forest plan included in Appendix B. Land Management Plan (Proposed Action).

Table 100. The total acres of eligible wild and scenic river classifications in the existing condition compared to the proposed action

Eligible	Existing Condition	Proposed Action
Recreational	47,340.4	3,188.4
Scenic	9,335.2	710.9
Wild	98,801.8	0

Table 101. The total acres of suitable wild and scenic river classifications in the existing condition compared to the proposed action

Suitable	Existing Condition	Proposed Action
Recreational	0	4,496.9
Scenic	0	25,736.6
Wild	0	31,615.3
Totals	155,477.4	65,748.2

Table 102. The acres of secure habitat within eligible wild and scenic river classifications

Secure Habitat within Eligible WSR	Existing Condition	Proposed Action
Eligible - Total Secure Habitat	103,465	773
Recreational	3,726	62
Scenic	7,684	711
Wild	92,054	0

Table 103. The acres of secure habitat within suitable wild and scenic river classifications

Secure Habitat within Suitable WSR	Existing Condition	Proposed Action
Recreational	0	3
Scenic	0	11,884
Wild	0	28,532
Suitable - Total Secure Habitat	0	40,419

Table 104. The acres of secure grizzly bear habitat within suitable and eligible Wild and Scenic river corridors

Wild and Scenic Rivers Type	Existing Condition	Proposed Action
Eligible	103,465	773
Suitable	0	40,419
Grand Total	103,465	41,192

Table 105 The new additions as suitable wild and scenic rivers along with the acres of secure habitat within the river corridor.

New Rivers Added via Suitability	Acres of Secure Habitat
Middle Fork Kelly Creek	1,423
North Fork Kelly Creek	1,746
South Fork Kelly Creek	1,769
Weitas Creek	309
Total	5,247

Table 106 The rivers that will not be eligible wild and scenic rivers under the proposed action, the acres of secure habitat and whether there is potential to reduce secure habitat because of the change in eligibility.

Formerly Eligible River Name	Location and New land allocation	Acres of Secure Habitat	Potential to Reduce Secure Habitat Because of the Change from Eligible?
Bargamin Creek	MA 1-Frank Church River of No Return Wilderness and MA 2 Meadow Creek recommended Wilderness Area	5805	No
Bear Creek	MA 1- Selway Bitterroot Wilderness	6949	No
Brushy Fork Creek	MA 1 - Selway Bitterroot Wilderness	2443	No
Cub Creek	MA1- Selway Bitterroot Wilderness	4964	No
East Fork Moose Creek	MA1- Selway Bitterroot Wilderness	10578	No
Johns Creek	MA1-Gospel Hump Wilderness, MA2 -Gospel Hump Multi-Purpose Area, and MA3	5497	Yes- Some portions of the river corridor are within Recreation Opportunity Spectrum Settings that allow motorized uses.
Lake Creek	MA 3 and MA 1 - Gospel Hump Wilderness	3192	Yes – While the majority of the stream passes through the Gospel Hump Wilderness, approximately 3.6 miles of the headwaters pass through private lands and portions of MA3 where motorized uses are suitable. These areas are mostly within areas that are not secure habitat.
Moose Creek	MA 1 - Selway Bitterroot Wilderness	1008	No
North Fork Moose Creek	MA 1 - Selway Bitterroot Wilderness	67	No
Paradise Creek	MA 1 - Selway Bitterroot Wilderness	4190	No
Rhoda Creek	MA 1 - Selway Bitterroot Wilderness	4637	No
Running Creek	Mostly MA 2 Meadow Creek Recommended Wilderness Area/IRR-Wildland Recreation, and some MA1- Selway Bitterroot Wilderness	4439	No, the river corridor falls entirely within non-motorized ROS settings.
Slate Creek	MA1 Gospel Hump Wilderness Area, MA2 - IRR Backcountry Restoration, and MA3	1973	Yes, some of the river corridor flows through the areas that are suitable for motorized uses. However, most of the secure habitat within this river corridor falls within the Gospel Hump Wilderness and would still be unsuitable for motorized uses.

Formerly Eligible River Name	Location and New land allocation	Acres of Secure Habitat	Potential to Reduce Secure Habitat Because of the Change from Eligible?
South Fork Clearwater River	MA3	3	Yes because it would all be suitable for motorized uses, but results in little change to secure habitat because there is little secure habitat in the river corridor.
Three Links Creek	MA1 Selway Bitterroot Wilderness	4269	No, would be managed as designated wilderness.
Wahoo Creek	MA1 - Selway Bitterroot Wilderness	2920	No, would be managed as designated wilderness.
West Fork Gedney Creek	MA1-Selway-Bitteroot Wilderness, and MA2 -IRR Backcountry Restoration	1507	Yes, about half the river corridor would be in an area suitable for motorized uses so could have motorized trails constructed.
West Fork Three Links Creek	MA1- Selway Bitterroot Wilderness	1689	No, would be managed as designated wilderness.
West Moose Creek	MA1 - Selway Bitterroot Wilderness	2623	No, would be managed as designated wilderness.
North Fork Clearwater	MA 3, MA2 – IRR Primitive, and Backcountry Restoration. River corridor also occurs in semi-primitive non-motorized, roaded natural, and semi-primitive motorized.	67	Yes- occurs in several management areas, roadless rule themes and motorized ROS settings. While this is one of the longer rivers in the plan area, there is currently little secure habitat within the corridor.

Effects of Proposed and Designated Research Natural Areas

Research Natural Areas (RNAs) are areas that the Forest Service has designated to be permanently protected and maintained in natural conditions. The plan area contains several designated and proposed research natural areas under the 1987 forest plans. The plan also identifies and proposes additional research natural areas as part of the proposed action. Research Natural Areas (RNAs) are permanently established to maintain areas of natural ecosystems and areas of special ecological significance. These protected natural areas include unique ecosystems or ecological features; rare or sensitive species of plants and animals and their habitat; and/or high-quality examples of widespread ecosystems. These areas form a long-term network of ecological reserves established as baseline areas for non-manipulative research and the maintenance of biodiversity. Table 107 shows the acres of designated and proposed Research Natural areas and the acres of secure habitat as proposed in the plan.

Table 107 The acres of designated and proposed or Candidate Research Natural Areas in the Existing Condition compared to the Proposed Action and the amount of secure habitat contained within designated, proposed, and candidate Natural Research Areas.

Research Natural Area	Proposed Action Acres	Acres of Secure Habitat
Designated	29,499	21,121
Proposed or Candidate	2,947	2048
Total	32,446	23,169

Except for RNA's located within Management Area 1 land types, research Natural Areas are managed as Management Area 2 and have their own set of forest plan components. The management of research natural areas emphasizes maintaining them in a natural condition. The plan manages proposed and designated research natural areas the same. Desired condition MA2-DC-RNA-01 expresses how these areas should be managed. It states that designated and proposed research natural areas maintain a representation of natural systems found on the Nez Perce-Clearwater as a baseline for research, monitoring, and education by the agency, academia, and public interests. Wildfire, insects, and pathogens, along with other processes and disturbances, continue to affect vegetation, reflecting the dynamic nature of the systems they represent. Research natural areas contribute to ecological sustainability and biological diversity.

The plan includes two standards and suitability components that dictate the types of activities allowed within these areas. MA2-STD-RNA-01 prohibits the authorization of the collection of forest products for commercial purposes and personal use purposes, including firewood within designated and proposed research natural areas. MA2-STD-RNA-02 prohibits uses that threaten or interfere with the objectives or purposes for which a research natural area is established. Suitability plan components in the Research Natural Areas section of the Plan included in the Appendix of the BA below shows the actions that are suitable and unsuitable within research natural areas. Suitability components find many activities that impact grizzly bear secure habitat as unsuitable including motorized travel, permanent roads, and temporary roads unsuitable.

Research Natural Areas combine for only 32,446 acres, and consist of small, scattered areas, so their contribution to grizzly bear habitat is relatively small but they do add protections to maintain some habitats and contribute to connectivity. They contribute to the protection of 23,169 acres of secure habitat and secure habitats make up 71 percent of research natural areas. They often overlap with other land allocations and plan direction for research natural areas provides additional protection to those areas.

Timber Suitability, Production, Harvest, and Vegetation Restoration

The revised plan contains desired conditions for landscape patterns, size classes, vegetation density, structure, dominance type and composition that are based on the natural range of variation to provide habitat diversity that should contribute to grizzly bear habitat. Plan components in this section are informed by modeling the natural range of variability and should contribute to ecosystem integrity. Desired conditions would be achieved through a variety of vegetation treatments. Vegetation activities could occur through timber harvest, prescribed fires, fuels treatments, planting, wildfire, other forestry or restoration methods, or other mechanical treatments. The plan also includes objectives for timber production which, in many cases, would be produced while taking actions to meet desired vegetation conditions. Generally, the consequences of this direction would be beneficial to grizzly bears over the long term but would require habitat alterations over the short term.

Where timber production, and harvest is allowed or prohibited depends on land allocations and associated suitability for these uses. Timber production, harvest, and restoration is not restricted within Management

Area 3 except where there are resource concerns such as within riparian habitat conservation areas, steep slopes, landslide prone areas, and so forth.

Timber harvest may occur with or without road construction involved. Roads would be restricted by the Idaho Roadless Rule or Wild and Scenic River suitability plan direction when conducting vegetation treatments in Management Area 2. In Idaho Roadless Rule areas, vegetation management would be primarily prescribed fire or harvest from existing roads. The treatments might draw bears into these areas when harvesting from existing roads. Site specific analysis and project decisions would consider measures to prevent drawing grizzly bears into forage resources created by vegetation treatments and address these concerns at the project level.

In Management Area 3, the benefits of vegetation conditions would be offset by the presences of roads and would have greater chances of adverse effects on grizzly bear survival because some roads would be constructed to achieve desired conditions. We can expect better body condition and better survival in bears where vegetation treatments occur in association with lower road densities, such as in wilderness, recommended wilderness, and Idaho Roadless Rule Areas. Intensity of human use of these areas are lower because of limited access. These alternatives are integrated with the objectives for fire and fuels management under the Revised Forest Plan. The amount of disturbance needed to restore the forest to the desired vegetation conditions were set based on the pace it would take to achieve these desired conditions within a specified time frame in years. The acres of vegetation treatments under the existing condition is about 40,000 acres annually, compared to 53,000-64,500 in the proposed action. These acres include prescribed fire, wildfire, timber production, fuels treatments, wildlife habitat enhancement, and vegetation treatments designed to restore vegetation characteristics found in desired conditions. These acres include treatments that would occur across all management areas.

For timber production acres, the existing condition is the acreage conducted annually under the 1987 plans which is 4,300 acres or 50-60 mmbf per year. The proposed action would establish a range of acres as objectives between 8,825-10,000 acres annually for a production amount of 190-210 mmbf annually. Most of this timber production would occur within Management Area 3, while Management Area 2 would receive limited timber harvest to meet resource objectives other than timber production, and management area 1 would not receive timber harvest except as allowed by enabling legislation for designated lands. In Management Area 3, roads or temporary roads would typically be associated with timber production and may draw human use after treatments. Bears attracted to vegetation treatments within Management Area 3 would likely encounter higher probabilities of human-bear conflicts. Associated roads along with human activity can negatively affect grizzly bears by disturbing or displacing bears during logging activities and by increasing mortality risk (Zager et al. 1983). In the Warm Moist broad potential vegetation type, many areas would be planted to restore western white pine. Western white pine restoration is most effective after an even aged harvest such as a clear cut, and then planted with blister rust resistant white pine seedlings. Therefore, the acres of white pine restoration should be assumed to follow this type of treatment. The plan has objectives to treat 34,440 acres of the warm moist broad potential vegetation type every five years, some of which would be to restore western white pine. The plan also has desired conditions where white pine increases across the warm moist and cool moist broad potential vegetation types. Areas harvested for timber production or timber harvest must be restocked with trees within five years of treatment. In contrast, areas burned by prescribed or managed fires are often left to recover naturally. Restoration of white pine could change the seral stage and dominance type of forested vegetation, which could produce improved forage conditions or increase nutritional resources over the short term but remove mature forest.

The plan does not have components to direct management to consider or restrain where potential grizzly bear foods are promoted or produced from vegetation treatments. For vegetation projects, managers could consider how the arrangement of treatments could potentially produce foods that could attract bears to areas where conflicts may occur during project development and could take measures that could reduce this potential conflict. Each project could be analyzed as to whether an individual project would attract bears into a conflict on a case-by-case basis. In any case, each project would have its own environmental analysis and be consulted on with the U.S. Fish and Wildlife Service for effects to federally listed species.

Grizzly bears use a variety of habitat conditions and variety in vegetation size classes, densities and dominance types would contribute to grizzly bear habitat. Vegetation management may alter the amount and arrangement of cover and forage available to bears. Use tends to be more frequent in areas that offer some type of hiding cover nearby, particularly during daylight hours (Aune and Kasworm 1989b, Mace and Waller 1997). Vegetation management may alter the amount and arrangement of cover and forage available to bears. Waller (1992) reported that grizzly bears avoided lower-elevation, more accessible harvested stands, as well as stands less than 30–40 years old where the vegetation had not recovered enough to provide cover. Timber harvest and fire can locally increase bear foods by stimulating the growth of grasses, forbs, and berry-producing shrubs. Bears that used regenerating forest habitats (mostly due to forest harvesting) containing a diversity of age classes were more likely to see gains in their body condition, whereas bears that used older forests were more likely to see reductions in body condition (Boulanger et al. 2013). However, survival rate was reduced by road densities which in turn were positively correlated with regenerating forest habitat (Boulanger et al. 2013). Human activities which promote young regenerating forests, such as forest harvesting, therefore promotes improved health (increased body condition) in bears but are offset by reductions in survival rates because of higher road densities. Grizzly bears in management area 3 would have better body condition because of better nutrition but lower survival due to increased human bear conflicts as a result of more motorized access (Boulanger et al. 2013).

Management Area 3 currently has higher road densities, more human activities, and more developments than Management Area 2 and 1. Management area 3 is where most of the timber production and associated road development would occur. A geospatial analysis of the Nez Perce-Clearwater road system, under the1987 forest plans, indicates that 1,035,819 acres, or 83.5 percent, of the 1,1,240,340 acres in Management Area 3 is within 1600 feet of a roadway and could be harvested from existing roads. Therefore, while some timber is not yet accessed and will require some new road construction, there is limited areas within Management 3 where additional roads are required to access the timber, which naturally limits the addition of new roads. However, additional roads may need to be constructed to access the remaining 204,521 acres for vegetation management. There is currently only 194,805 acres of secure habitat in Management Area 3 and composes about 16 percent of this management area, most of which exists in smaller blocks and these would be most likely the areas that may be impacted under the proposed action. Although it is currently where and how many roads would be constructed.

Vegetation management in Management Areas 2 and 1 to meet desired vegetation conditions would mostly be treated with prescribed fire or wildfire. These treatments would produce better body conditions because of more nutritional resources and promote higher survival rates. These two MAs areas account for most of the forest and the best areas for habitat conditions for grizzly bears. Vegetation management in these two MAs would not require permanent road construction in most cases, however temporary roads may be needed. In some areas of Management Area 2, temporary roads may be build based on allowances in the Idaho Roadless Rule, recreation opportunity spectrum, and suitability. The effects of temporary roads are short term for grizzly bears. Road building would only be allowed to the extent that the Idaho Roadless Rule allows and is not allowed in designated wilderness. Timber harvest is suitable for other resource reasons within Idaho Roadless Rule area but are limited to areas within reach of existing roads or by helicopter. However, much of the Idaho Roadless Rule areas are outside the reach from existing roads and are not suitable for harvest (table 108). The entirety of the Bitterroot Recovery Zone is not suitable for timber harvest of any kind.

Not all temporary roads would likely to be constructed at once. Some of the roads would be consolidated in project areas and be constructed and used at the same time, which would concentrate effects on bears into a smaller area. Temporary roads would be separated by space and time across the Forest, which may affect more individual grizzly bears, but have less intense effects. As temporary roads are usually closed immediately after the completion of harvesting activities, they don't have prolonged impacts. In some cases, they can be open for up to five years if projects are implemented over multiple years.

For ease of discussing the effects, there are essentially three types of timber suitability, 1) Suitable for timber production, 2) Suitable for timber harvest for other resource objectives but not for timber production, and 3) Not suitable for production nor harvest. The acres and percent of the Forest that is suitable for the different types of timber suitability are shown in table 108. Timber production is unsuitable on about 73.5 percent of the forest and thus prohibited. Timber harvest of any kind is unsuitable on about 58.7 percent of the forest. Timber production is only suitable on about 26.5 percent of the forest. The different types of timber suitability largely follow the distribution of land allocations such as management areas, designated wilderness, recommended wilderness, wild and scenic rivers, and Idaho Roadless Rule Areas. Relatedly, timber activities won't create the need for new motorized features in areas unsuitable for timber production, and timber activities are less likely to be the cause of new motorized routes in areas suitable for timber harvest but unsuitable for timber production.

Secure habitat would need to be treated in MA2 to achieve vegetation desired conditions. Treatment examples include prescribed fire, wildfire, non-commercial tree cutting, commercial harvest or other methods. In Idaho Roadless Rule areas, which make up the majority of Management Area 2, timber harvest is limited by the Idaho Roadless Rule. For example, the final environmental impact statement for the Idaho Roadless rule projected that less than 0.01 percent of roadless area per year of the lands managed under the Idaho Roadless Rule would be affected by timber removal or road construction in the first 15-years. For the approximately 1,481,636 acres of roadless areas on the Nez Perce Clearwater, this would total 1,500 acres over the 15-year period, or approximately 100 acres per year (U.S. Department of Agriculture 2008a). Per the Idaho Roadless rule, timber harvest activities must be conducted from existing roads or aerial harvest systems. In the 10-year period from October 2008 to September 2018, approximately 1,800 acres have been affected through community protection zone fuels reduction, constructed fuel breaks during wildfires, and removal of post-fire roadside hazard trees. This trend of timber harvest in Idaho Roadless Rule areas is expected to continue. In Idaho Roadless Rule areas, vegetation treatments are likely to be implemented as prescribed fire or wildfire managed to achieve land management plan objectives. Some areas within community protection zones could also be treated to reduce hazardous fuels and may include the construction of temporary roads.

Neither timber harvest, nor production are not suitable within recommended wilderness nor in designated wilderness areas. Therefore, it will not be allowed there, which would prevent effects from these activities to habitats within the Bitterroot Recovery Zone. While prescribed fire is suitable within wilderness and recommended wilderness, it is more likely to be treated with wildfire managed to achieve land management plan objectives in these areas in order to maintain wilderness character.

The amount of currently secure habitat that will occur within the three suitability classes for the existing condition and the proposed action are shown in table 109. Overall, in the proposed action, about 81 percent of currently secure habitat is not suitable for either harvest nor production, 12 percent is suitable for harvest for other resource reasons, and only about 7 percent is suitable for timber production. Under the existing condition, about 82 percent of secure habitat is not suitable, 12 percent is suitable for harvest and 7 percent is suitable for production. Therefore, the difference is only about 1 percent of secure habitat or about 22,725 acres of area not suitable. About 21,522 acres more are suitable for timber harvest in the proposed action compared to the existing condition. The amount of secure habitat suitable for timber production varies little, 1,202 acres, between the proposed action and the existing condition. The reason is because most of the area suitable for timber production currently lacks much secure habitat to begin with and because so much of the forest is not suitable due to Idaho Roadless Rule and Wilderness Restrictions. It can be expected that much of the seven percent of secure habitat suitable for timber production would be impacted by timber activities including harvest or additional road development. Furthermore, existing secure habitat in areas suitable for timber production are small and fragmented. Areas suitable for timber production mostly occur within Management Areas 3, which is an area not biologically suitable nor socially acceptable for grizzly bears. Bears that move into Management Area 3, where most timber production would occur, would likely have a lower survival rate under both existing conditions and under the proposed action. Every vegetation project will undergo site specific environmental analysis and Endangered Species Act consultation prior to approval an implementation.

Table 108. The acres and percent of the plan area that is either suitable for timber production, suitable for harvest for other resource objectives and areas not suitable for timber harvest nor production

Timber Suitability Type	Total Acres	Percent of the Forest*
Suitable for Timber Production	1,042,519	26.5
Suitable for timber harvest for other resource objectives	586,014	14.9
Not suitable for timber harvest nor production.	2,310,523	58.7

*Percentages rounded to the nearest tenth

Table 109. The acres and percent of currently secure grizzly habitat in the three timber suitability types

Secure Habitat Suitability type	Proposed Action Acres	Proposed Action %	Existing Condition Acres	Existing Condition %
Not suitable	1,992,830	81%	2,015,555	82%
Suitable for Harvest	306,628	12%	285,106	12%
Suitable for Production	163,621	7%	162,419	7%

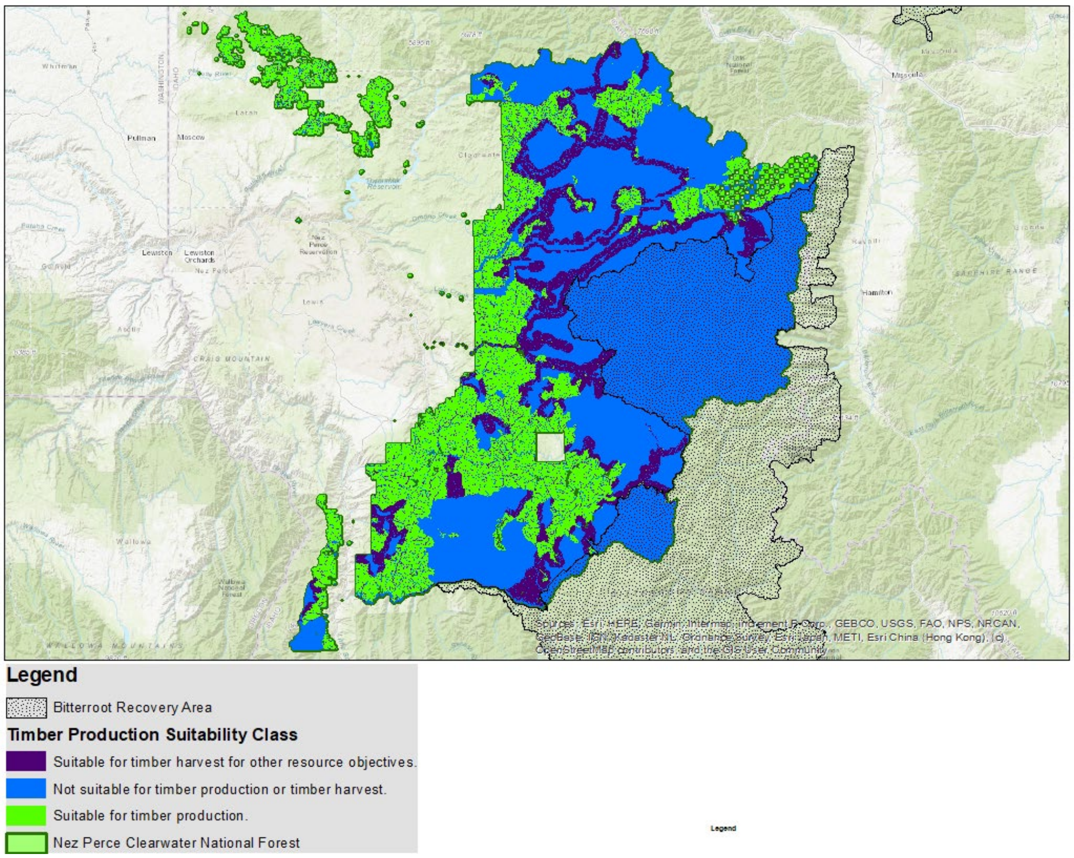


Figure 47. Timber Suitability class distribution in the plan relative to the Bitterroot Recovery Zone. Bright green represents areas suitable for timber production, purple represents areas suitable for harvest to meet other resource objectives such as restoration, and areas in blue are not suitable for harvest nor production.

The National Forest Management Act of 1976 (NFMA) established provisions and limitations on timber harvest activities including limits on the maximum size of regeneration harvest. The 2012 Planning Rule and Forest Service Handbook 1909.12 require that plan components incorporated into revised plans need to maintain and restore ecosystem integrity. The planning Rule defines Ecosystem Integrity as “the quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence.”

The 2012 Planning Rule (36 CFR 219.11 Timber requirements) requires that plan components comply with the 40-acre maximum opening size required under NFMA (4)(d). Exceeding the 40-acre maximum is allowed under the NFMA but in order to do so, the Forest Service must allow a 60-day comment period and must receive approval from the next level above the deciding official, who is usually the Forest Supervisor, and the next level up is typically the Regional Forester.

The 2012 Planning Rule permits Forest Plan Standards for opening sizes that exceed the 40-acre maximum required under NFMA if the responsible official determines that it is necessary to achieve desired ecological conditions as set-fourth in Section 219.11 (d)(4)(i) as follows:

> *"Plan standards may allow for openings larger than those specified in paragraph (d)(4) of this section to be cut in one harvest operation where the responsible official determines that larger harvest openings are necessary to help achieve desired ecological conditions in the plan area. If so, standards for exceptions shall include the particular conditions under which the larger size is permitted and must set a maximum size permitted under those conditions."*

To that end the plan established a plan standard that establishes the size below which a project does not require Regional Forester approval and the 60-day comment period. The size of openings of regeneration harvests was identified such that they better replicate the size of openings under natural disturbance with the Natural Range of Variation. Under the 1987 forest plans, the 40 acres limit was exceeded periodically with Regional Forester's approval.

The Natural Range of Variation (NRV) is an ecological concept that seeks to describe the landscape conditions that existed before modern forestry practices were adopted (Wiens et al. 2012). Vegetation patch sizes both affects and is affected by disturbance events including wildland fire, insect infestations and tree diseases. Opening size and pattern of vegetation is a major influence on species composition, forest stand structure, ecosystem function and habitat connectivity (Hagmann et al. 2021). Managing forest vegetation within the context of natural disturbance regimes requires an examination of actions implemented at appropriate spatial and temporal scales to address the ecological characteristics that compromise sustainability. The abundance, average size, and range of sizes of early successional forest patches, or "openings" have been identified as the key ecosystem characteristics to represent landscape pattern because this condition is quantifiable and is meaningful for many wildlife and plant species. Openings in the forest are created after a stand-replacing disturbance like wildfire. They are meaningful to many wildlife species because of their distinctive composition and openness, which affects the growth and survival of plants that some wildlife depends on and represent significant ecological contrast to adjacent mid or late successional forest ("edge"). Furthermore, patch size and distribution affect or influence the distribution and habitat selection of some wildlife species. Examples include elk, the fisher, and some migratory birds. They also represent the initiation point in forest development, the foundation upon which rests the pattern of the future forest.

The Terrestrial Ecosystem Plan components are founded upon analysis of ecological composition, structure, function, and connectivity. Forest management that focuses restoration at scales within the Natural Range of Variation may support desired conditions focused on maintaining and enhancing ecosystem integrity. Note that the maximum opening size standard only pertains to the size above which requires Regional Forester approval. It does not preclude creating openings larger than this size by following the proper approval process and comment period, for example Regional Forester approval and required comment period. Openings smaller than the standard size may also be appropriate.

To inform the maximum size of regeneration units, the Forest Service used a state and transition model known as the SIMulating Patterns and Processes at Landscape scaLEs (SIMPPLLE model) (Chew et al. 2012b) to inform the patch size distribution under simulated natural disturbance. The spatially-interactive model SIMPPLLE incorporates climate data, fire logic, and vegetation growth pathways to estimate forest growth and disturbance for a period of approximately 1000 years. The model is calibrated with empirical data, expert knowledge, climate data and relevant scientific studies as a basis for model information and assumptions. Model results were compared to the current patch size distribution currently on the Forest.

Model results suggested that the forest is currently departed from its patch size distribution wherein current average patch sizes are much smaller than the average size of regenerative disturbance under the Natural Range of Variation. This is the result of fire suppression and a number of small mechanical treatments that are the result of timber harvest in recent decades which followed the 40-acre limitation found in NFMA. Additionally, it severely departed relative to the area weighted mean, meaning that many more acres of open or early seral forest where composed of very large early seral patches driven by wildfire disturbance. In the simulation, patch size of openings ranged from 6 to larger than 457,299 acres, and that 25 percent of all openings were from patches between six and 1,785 acres and an estimated 75 percent of patch openings were larger than 1,785 acres.

Patch sizes were aggregated using Jenks breaks to facilitate analysis and were used to group patch size classes into 10 bins. The smallest bin size ranged from zero to six acres and was an artifact of the grain size of the model. The second largest bin size, six to 1,785 acres was identified as the bin size most appropriate to replicate the size at which forest vegetation management was most appropriate. The within bin distribution was large so the average within the bin was estimated from the maximum 90th percentile size patch to identify the appropriate maximum patch size for the plan standard. The average patch size was also estimated within each broad potential vegetation type (PVT type) because fire behavior can be different within different PVT types.

The Forest wide average patch size within bin 2 estimated by maximum 90th percentile was 350 acres. The average size within broad PVT's are as follows: the warm dry was 77, warm moist was 160 acres, cool moist was 188 acres, and within the cold was 95 acres. If forest management is to better reflect the distribution of early seral conditions under natural disturbance, then the patch size of forest management would need to increase. Mechanical treatments would be used to reflect smaller opening size creation through natural processes such as insect infestations and spot fires, while at the same time puts the onus of larger openings on wildfires. The maximum opening size before Regional Forester approval is established in FW-STD-TBR-06. The proposed action would allow regeneration harvest up to 207 acres before regional forester approval is required. This number was the average opening size of the second bin. This standard applies to newly created harvest openings from mechanical vegetation treatments on National Forest System lands only and need not consider existing recently created opening on National Forest System lands, adjacent private lands, or other agency lands. The areas where this standard would apply is forest wide and it would only apply to mechanical treatments that regenerate forests, such as clearcutting, seed tree cutting, shelterwood seed cutting, or other cuts designed to regenerate an even-aged stand of timber in a single harvest operation.

The size of openings would influence the arrangement of vegetation patches on the landscape resulting from timber harvest. This patch size would be used most within Management Area 3 as that is where timber harvest is more often going to occur. Nevertheless, the prevailing driver of the patch distribution within the plan area will still be wildfire disturbance as it would continue to be the prevailing agent of change on the landscape.

The 207-acre maximum opening size would allow more flexibility to restore a landscape pattern that existed under natural disturbance. The smaller maximum opening size in the 1987 plan was too small to replicate the patch size and distribution as would have occurred under natural disturbance. As a result, the patch size and distribution characteristics are departed from their historical size because the patch sizes are too small. The plan desired conditions MA1 and MA2- DC-FOR-05 and MA3-DC-FOR-09 would direct forest vegetation to reflect the landscape pattern of natural disturbances. The larger patch size limit would better allow active management to restore conditions more similar to the patch size present under natural disturbance. Expanding the maximum size of regeneration harvest would allow the Forest to work towards restoration of a landscape pattern consistent with those that existed under natural disturbance from a patch size standpoint. Under the proposed action, the maximum opening size set by the standard could still be exceeded following a 60-day comment period and Regional forester Approval. FW-STD-TBR-06 would not apply to openings resulting from natural conditions such as fire, insect and disease attack, or windstorm as specified in FW-STD-TBR-08.

The effects of this direction would be that the forest would trend towards a vegetation patch size more like the patch size under natural disturbance. A larger maximum patch size would make larger openings on the landscape. As a result of the larger patch size allowance, more patches of larger size would be produced via timber harvest and other mechanical vegetation treatments. Larger opening sizes in some cases would require less road construction than 40 acres cuts because more area could be accessed from a single road to a larger patch opening vs many roads to access smaller spread-out smaller patches. However, the road system would be determined based on-site specific considerations. There would be more nutritional resources for grizzly bears because in many cases nutritional resources originate from early seral conditions because these are the conditions that facilitate berries, grasses, and feed prey species. So larger patches would also maintain and facilitate bear nutrition. Larger patch opening sizes are not expected to impact connectivity for grizzly bears as grizzly bears move easily through both forested and early seral conditions.

Research suggested that grizzly bears actively selected for larger cut blocks in British Columbia (Ciarniello et al. 2015). Ciarniello et al., (2015) used location data on 28 (16 females, 12 males) grizzly bears between 1998-2003, to determine how bears would respond to the resulting reduction in mature pine forests and increase in the number and size of cut blocks. Grizzly bears used pine stands less than expected and cut blocks more than expected, selecting for cut blocks in spring and summer but not in fall. cut block size influenced selection by bears during the spring and summer but not in fall with grizzly bears being 4 times more likely to select for very large cut blocks (16,308 to 17,297 acres) than smaller blocks. In summer, bears selected for larger cut blocks with higher greenness values, at higher elevations, and where the risk of human-caused mortality was greater. In fall, bears remained closer to block edges and used younger stands. Bears spent a significantly greater fraction of their time in cut blocks during the night than during the day and during 'active' versus 'resting' periods in all 3 seasons. Selection for large blocks suggests that bears may respond positively to a harvest regime that mimics the size of natural disturbances. Ciarniello et al., (2015) concluded that following an ecosystem management (i.e., natural disturbance) approach to forest harvesting will foster use by grizzly bears inhabiting working forests. They also concluded that the potential benefit of large cut blocks to bears could be outweighed if larger blocks contribute to higher grizzly bear mortality. Attracting grizzly bears via larger openings could potentially result in mortality if larger openings are also associated with increased roads and human access. However, Ciarniello et al., (2015) suggested that grizzly bears accessed large openings more often at night as a strategy to presumably to avoid humans.

From a practical standpoint, the standard would apply more commonly within Management Area 3 but might also be use less often within Management Area 2 within the framework of timber suitability as explained above. It is reasonable to expect that these larger openings would occur across all of management area 3 throughout the life of the plan. The standard would also apply to Management Area 2 as well but mechanical treatments in MA2 would be less common and occur only when treatments would best be achieved through mechanical regeneration harvests. More often prescribed fire would be used in Management Area 2 to create large openings because of the practical limitations on timber harvest imposed by the Idaho Roadless Rule. Harvest (to meet other resource objectives) in MA2 is essentially going to be constrained mostly to existing roads or helicopter. Harvesting larger openings from existing roads could in some cases draw grizzly bears into areas accessible to humans in MA2 which might increase the probability of bear-human conflicts. However, because most of the treatments in MA2 are likely going to be via prescribed fires, harvesting from existing roads would be less common. The Forest

Plan standard limiting opening size would not apply to prescribed fires. So large openings created by fires or prescribed fires would create large openings to the benefit of grizzly bear selection without the associated motorized system access.

While the plan standard would apply forest wide, many areas of the forest are not suitable for timber harvest, and because it only applies to mechanical treatments, there is no effects from this plan components in areas not suitable for timber harvest, such as wilderness, recommended wilderness, and Idaho Roadless Rule within the Wildland recreation theme, the Wild classification of designated and suitable Wild and Scenic Rivers, designated Natural Research Areas, and non-forested lands.

Effects of Fire Management Direction

Wildland fire management includes all activities for the management of wildland fires to meet land management objectives. Fire management includes the entire scope of activities from planning, prevention, fuels or vegetation modification, prescribed fire, hazard mitigation, fire response, rehabilitation, monitoring, and evaluation. The management of wildland fire influences whether fire effects have beneficial or non-beneficial impacts on resources, such as air and water quality, wildlife habitat, recreation areas, and communities. Wildland fire management incorporates a spectrum of responses ranging from full suppression to managing for resource objectives. Suppression is a management strategy used to extinguish or confine all or a portion of a wildfire. Fuels management is the practice of controlling flammability and reducing resistance to control wildland fuels through mechanical, chemical, biological, or manual means or by fire in support of land management objectives. Fuels treatments result in a change in the amount, configuration, and spacing of live and dead vegetation, creating conditions that result in more manageable fire behavior and reduced intensity during future wildland fire events.

Plan components within the Fire Management section of the plan provides direction for vegetation treatments for fuels reduction, prescribed fire and through the management of vegetation via unplanned ignitions. The plan components would direct future actions related to both the prescribed fires, and direction on when and how fire suppression would be conducted in the future.

Fire management plan components would encourage natural fire or use prescribed fire across the planning area. Fire is likely to play a dominant role in shaping grizzly bear habitat over the life of the plan. FW-OBJ-FIRE-01 in the fire management section would seek to treat vegetation through a combination of managed wildfire or active burning between 530,000-645,000 acres every ten years. FW-OBJ-FIRE-02 sets the objectives for fuels treatments on 227,242 per decade under the Preferred Alternative. The consequences of these treatments could be both positive and negative for grizzly bears. FW-OBJ-FIRE-03 would encourage fire to play a natural role to reduce uncharacteristic and undesirable wildfire through the management of natural unplanned ignitions on between 360,258 acres per decade under the Preferred Alternative. The plan is integrated among resource areas such that fire is recognized as an important mechanism to achieve desired ecological and vegetation plan direction. The amount of disturbance identified in the objectives, along with the types of disturbance need to achieve desired vegetation conditions, included and accounting for both prescribed fires and natural ignitions. The amounts were estimated with the SIMPPLE Model, which modeled the vegetative response to timber harvest treatments and stochastic processes like wildfire. Therefore, the plan's fire objectives and other plan components were informed by the model's outcomes for both timber harvest scenarios in alternatives and incorporate the expected amount of future wildfire. Similarly, the plan's ecosystem components for vegetation desired conditions considered the amount of wildfire needed to achieve those desired conditions. Furthermore, they are established to represent our best estimate the conditions of vegetation within the natural range of variation under natural disturbance. The SIMPPLE model was calibrated based on the historical amount of wildfire, weather patterns and the distribution of fire starts. While we don't know where and when a wildfire will start, the model represents a good estimate of the amount of wildfire that can be expected during the life of the plan. Model outcomes suggest that wildfire will still be the predominant driver and agent of change in the vegetation conditions in the plan area despite the increased intensity of timber harvest objectives proposed. Therefore, the objectives within the plan components for Fire Management are paramount to the outcomes of the revised forest plan.

While it is impossible to predict when or where wildfire ignitions would start, the forest service has discretion on if, when, where, and how suppression activities would be conducted. However, it is reasonably certain that wildfire starts will occur each summer, the estimates of how much fire there will be on the landscape within the life of the plan are reasonable estimates, and it is reasonably certain that wildfire suppression decisions will be based on the guidance in the plan. The intent in the plan is that fire would play a natural role on the larger landscape compared to the 1987 plans. Some aspects of the 1987 plans required suppression in many cases and had thresholds that limited the amount of prescribed fire allowed in some management areas. The proposed plan allows for more flexible strategic planning and more flexibility during real time fire management decision making that would allow fire to play its natural role across the landscape. In some cases, wildfire is likely to be beyond the agencies' ability to suppress but these types of disturbances have been factored into our vegetation desired conditions and the fire management objectives.

These treatments would alter grizzly bear habitat and reduce cover but may enhance food sources. The effects of fuels treatments would be emphasized within the wildland urban interface. Treatments would also occur within Idaho Roadless Rule areas, recommended wilderness, and designated wilderness. Fire has been the dominant agent of change in grizzly bear habitat under natural disturbances, and bears are assumed to be adapted to these conditions. The location, types, size and distribution of fuels treatments and prescribed fires are not yet known. Prescribed fire, and fuels treatments are authorized only after site specific environmental analysis, and Endangered Species Act consultation. Activities for fuels treatments and prescribed fires often include establishment of containment lines, mechanical vegetation treatments and burning conducted under controlled conditions. Existing roads or trails are often used as containment lines. The effects of these treatments could be a change in seral stage and temporary disturbance in the local area. The plan also encourages allowing fires to play a more natural role in forest disturbance through wildfire managed to achieve land management plan objectives. Some but not all wildfire management activities require firefighter personnel to be present near the fire and includes firefighter camps, people using motorized vehicles to access areas to utilize containment lines by removing fuel and constructing fire lines. Aircraft are often used to move people and equipment, monitor burn conditions and applying fire retardant or water to control the fire intensity and spread rates of fires. Wildfire is the largest disturbance agent within the Forest and will be the driving force for change to the Forest's vegetation conditions.

Effects of Motorized Suitability and Summer Recreation Opportunity Spectrum

Public access was identified as a significant issue during scoping. The plan does not make site specific decisions on roads, nor motorized trails, nor does it authorize, fund or carryout actions nor decisions on the travel system. Therefore, the plan has only indirect effects on grizzly bears regarding travel management decisions. Instead, forest plans make decisions on the suitability of uses and broad direction under which future decisions for roads and motorized trails could be made. One such decision is on the suitability of motorized uses across the landscape. It should be recognized that identifying lands as suitable does not necessarily mean that these activities would occur on all portions, only that they would be suitable for such uses under future decisions.

The primary mechanism that determines motorized suitability is the Summer and Winter Recreation Opportunity Spectrum settings (ROS). However, the ROS was developed from consideration of the appropriateness of motorized uses within the various land allocations which fed into the identification of Summer and Winter ROS settings. Each land allocation also has its own suitability plan components that must be followed including the suitability of motorized uses. The summer and winter ROS settings are consistent with the suitability plan components within the various land allocation suitability components. Furthermore, the types of motorized uses that could occur in some areas suitable for motorized uses are influenced by management area direction. For example, some Idaho Roadless Rule areas are suitable for motorized uses but suitability plan components within the Idaho Roadless Rule section of the plan also provide guidance that can shape the types of motorized uses that occur, for instance roads are restricted but motorized trails are suitable.

The summer and winter Recreation Opportunity Spectrum settings influence the suitability of various activities, including whether an area is suitable for motorized travel, and sets the level of development that users may anticipate experiencing on roads and within recreation sites. Recreation opportunity spectrum settings for summer include classifications such as rural, roaded natural, semi-primitive motorize, primitive, and semi-primitive non-motorized. The motorized settings are the rural, roaded natural, and semi-primitive motorized settings while the non-motorized settings are the primitive and semi-primitive non-motorized. Summer Recreation Opportunity Spectrum settings take into account the suitability of summer motorized uses across all other management areas or land allocations. A map of the Summer Recreation Opportunity Spectrum settings for the baseline condition is shown on figure 48, while the Recreation Opportunity Spectrum Settings in the proposed action (figure 49). The areas that changed from the existing condition to the proposed action (figure 50). Several areas were identified and retained in non-motorized settings to provide for grizzly bear connectivity (figure 51). The ROS in baseline condition, as mapped for the no action alternative, do not represent a decision made in a planning document due to ROS not being used as a suitability plan component prior to the 2012 Planning Rule. Rather, the existing condition maps are a map based on mapping protocols and reflect how other decisions, such as travel plan decisions, have influenced the user's experiences. The 1987 forest plans have no provisions to manage consistent with the ROS classifications, the ROS classifications were an effect of other decisions implemented on the ground. In this revision, under the 2012 Planning Rule, ROS no longer is a mapped existing condition, but rather is a decision made by the responsible official that is tied to both a desired condition and suitability plan components to implement the decision. Thus, direct comparison of the existing condition ROS to the proposed action ROS is not always equivalent; the proposed action ROS is binding while the existing condition ROS is solely mapping based on a mapping protocol that takes into account other decisions that have been made.

The recreation opportunity spectrum has six distinct classes in a continuum that describe settings ranging from highly modified and developed to primitive and undeveloped (Clark and Stankey 1979, U.S. Department of Agriculture 1982b). Five of the recreation opportunity spectrum classes apply to the Nez Perce-Clearwater: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, and rural. There are no urban recreation opportunity spectrum classes on the Nez Perce-Clearwater. Allocations of these settings are decisions within the revised Forest Plan that dictate not only where motorized uses are suitable but also the extent of development or “developments” that are appropriate for an area. The table below defines the recreation opportunity spectrum classes and definitions.

Plan components within the sustainable recreation section of the plan contains plan components and suitability of uses that direct the forest to manage recreation consistent with the definitions table 110. Recreation Opportunity Spectrum settings are identified for both winter and summer. These provide direction across broad areas as identified above in the Effects of Motorized Suitability and Summer Recreation Opportunity Spectrum section (figure 49). Plan components in the Sustainable Recreation section of the plan include desired conditions and standards that require management of these settings consistent with their definition.

Table 110. Recreation Opportunity Spectrum classes and definitions[1]

Recreation Opportunity Spectrum	Definition
Primitive (P)	This setting supports large, remote, wild, and predominantly unmodified landscapes. There is no motorized activity and little probability of seeing other people. Primitive settings are managed for quiet solitude away from roads, people, and development. There are few, if any, facilities or developments. Most of the primitive settings coincide with designated wilderness boundaries and recommended wilderness areas.
Semi-Primitive Non-motorized (SPNM)	The semi-primitive non-motorized settings include areas of the Nez Perce-Clearwater managed for non-motorized use. Mechanized transport such as mountain bikes are often present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area. These settings are not as vast or remote as the primitive settings, but they also offer opportunities for exploration, challenge, and self-reliance.
Semi-Primitive Motorized (SPM)	This setting is managed for backcountry motorized use on designated routes. Routes are designed for off-highway vehicles and other high-clearance vehicles. This setting offers visitors motorized opportunities for exploration, challenge, and self-reliance. Mountain bikes and other mechanized transport are also sometimes present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area or providing portals to adjacent primitive or semi-primitive non-motorized areas.
Roaded Natural (RN)	This setting is managed as natural appearing with nodes and corridors of development that support higher concentrations of use, user comfort, and social interaction. The road system is generally well defined in this setting and can typically accommodate passenger car travel. System roads also provide access to other recreation opportunity spectrum settings of semi-primitive motorized, semi-primitive non-motorized, and primitive areas.
Rural (R)	This setting represents the most developed recreation sites and modified natural settings on the Nez Perce-Clearwater. Facilities are designed primarily for user comfort and convenience.

[1]Plan area does not have any areas in the urban setting

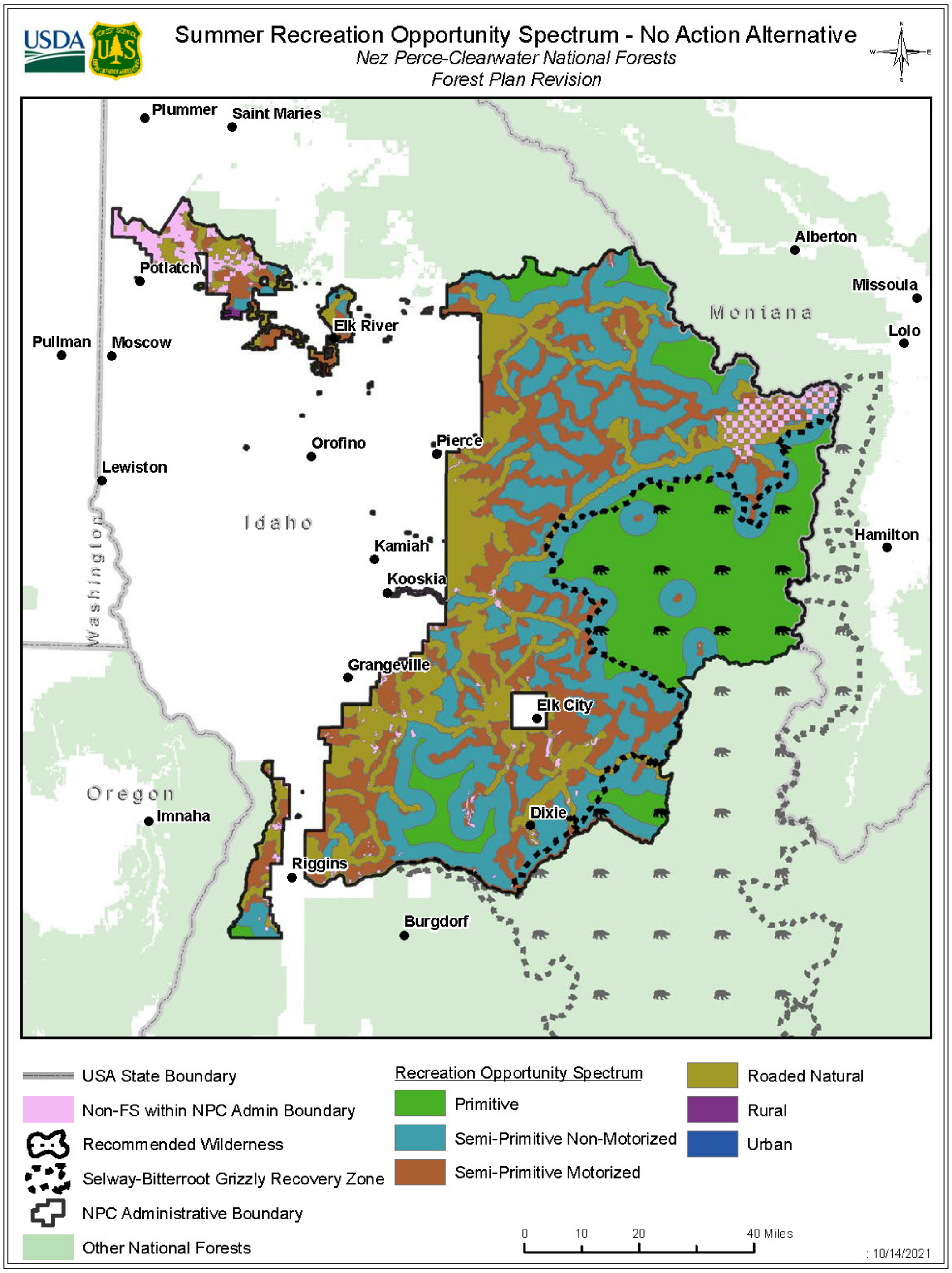


Figure 48. The Recreation Opportunity Spectrum Setting mapped under the existing 1987 forest plans

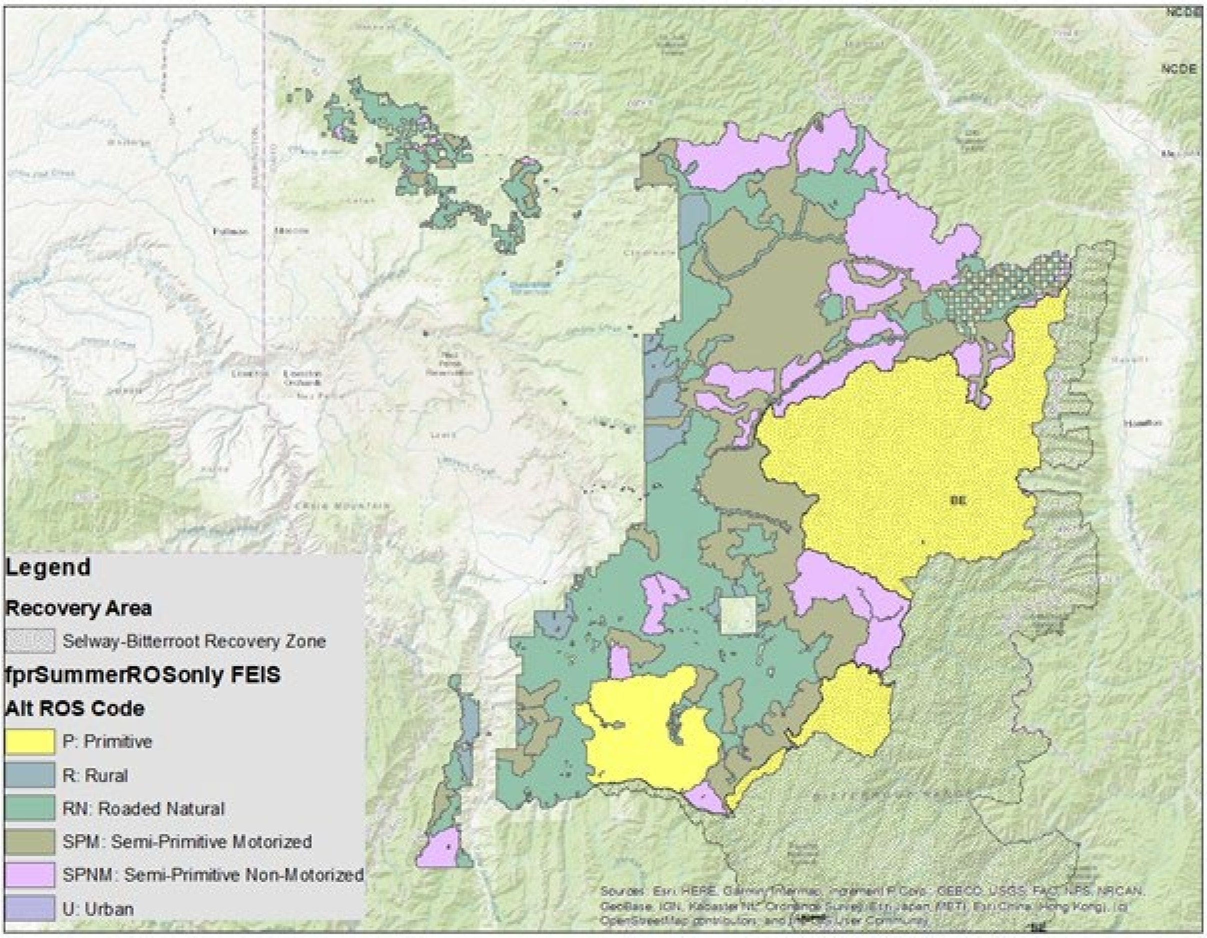


Figure 49. Summer Recreation Opportunity Spectrum under the proposed action relative to the Bitterroot Recovery Zone. Rural, Roaded Natural, and Semi-Primitive Motorized settings would be suitable for motorized uses while Primitive and Semi-primitive non-motorized are settings not suitable for motorized uses.

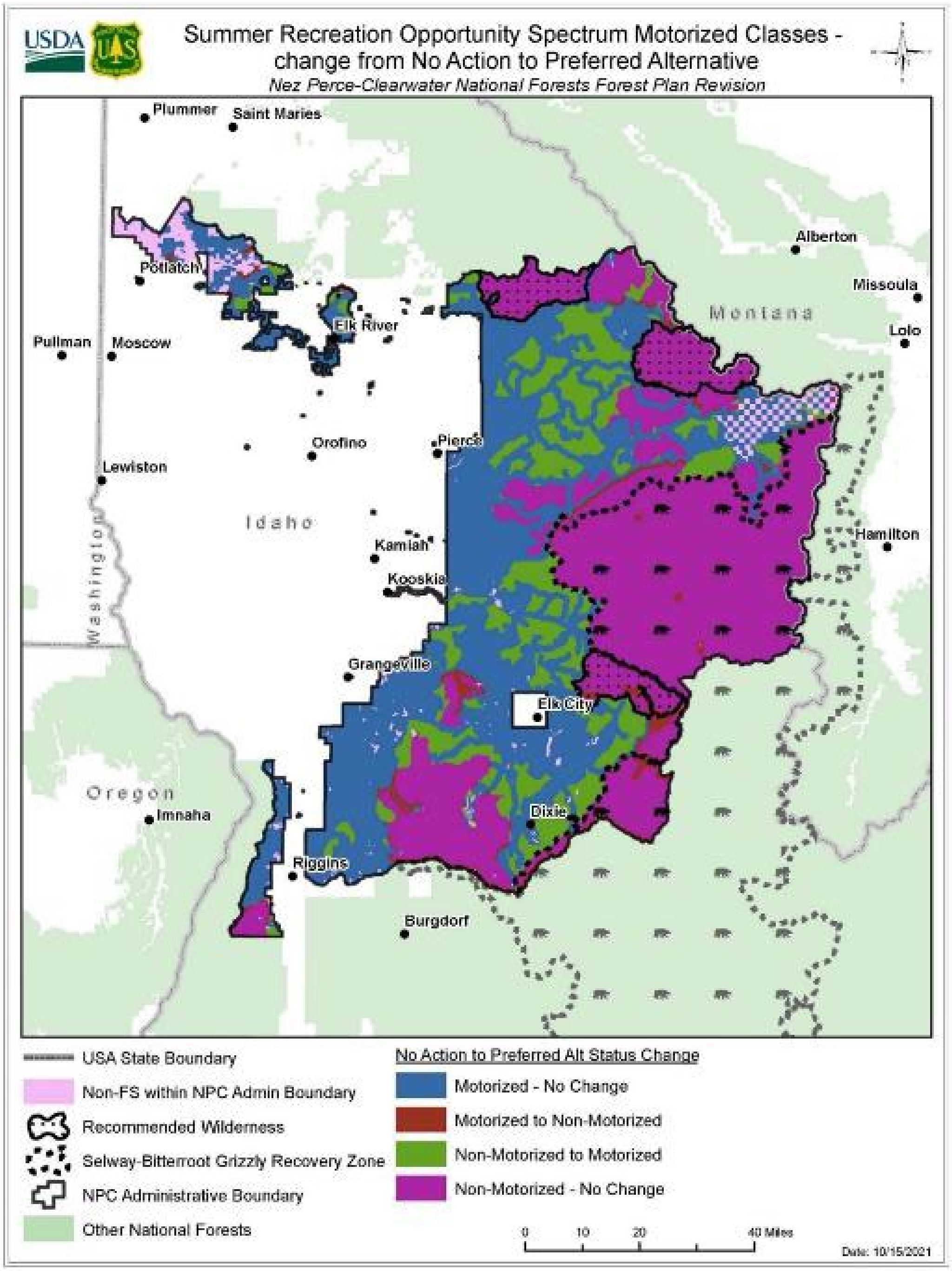


Figure 50. The change in motorized or non-motorized Summer Recreation Opportunity Spectrum settings in the proposed action compared to the 1987 forest plans

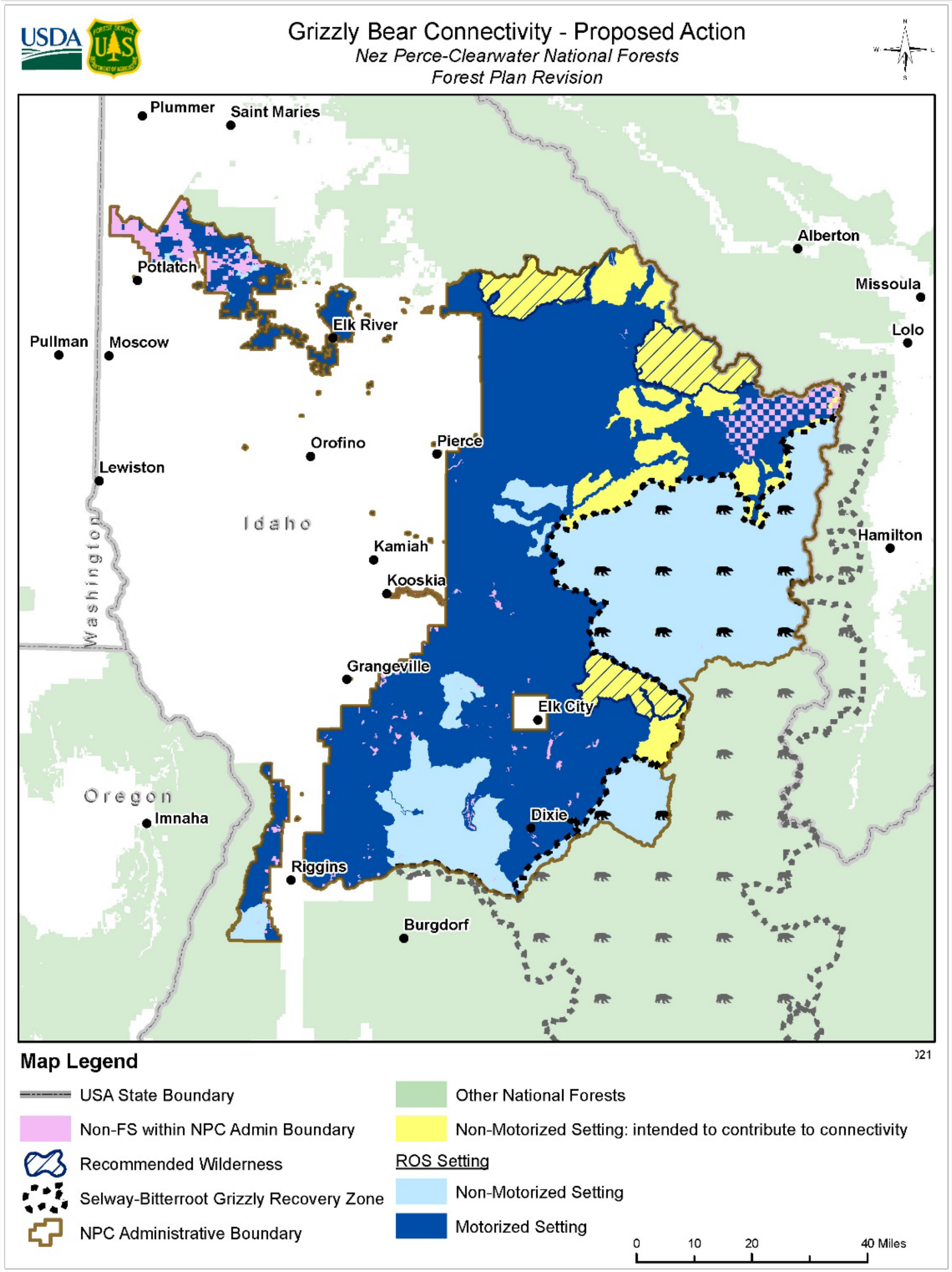


Figure 51. Areas identified as non-motorized in the summer Recreation Opportunity Spectrum Settings in part to provide for grizzly bear connectivity into and through the Bitterroot Recovery Zone

Table 111. Acres and percentage of summer recreation opportunity spectrum classes on the Nez Perce-Clearwater under the 1987 plans compared to the proposed action

Recreation Opportunity Spectrum Classes-Percent of Plan Area	Existing Condition Acres	Existing Condition Percent	Proposed Action Acres	Proposed Action Percent
Primitive	874,385	21.5	1,139,059	28.9
Semi-Primitive non-motorized	1,362,597	33.9	639,113	16.2
Semi-primitive motorized	857,816	21.9	966,465	24.5
Roaded natural	838,581	22.7	1,070,085	27.2
Rural	5,676	0.1	124,334	3.2

Table 112. Acres and percent of the total plan area suitable for summer motorized and non-motorized use on the Nez Perce-Clearwater in the proposed action compared to the existing condition

Motorized or non-motorized	Existing Condition Acres	Existing Condition Percent	Proposed Action Acres	Proposed Action Percent
Non-motorized	2,236,982	55.3	1,778,172	45.1
Motorized	1,702,073	44.7	2,160,884	54.9

Date Source: Nez Perce-Clearwater GIS data

Table 113. Acres and percent of secure habitat in various summer recreation opportunity spectrum categories in existing conditions and the proposed action

ROS Setting	Existing Condition	Percentage	Proposed Action	Percentage
Primitive	869,480	35	1,124,066	46
Rural	291	0	4,315	0
Roaded Natural	92,237	4	158,145	6
Semi-Primitive Motorized	257,358	10	605,122	25
Semi-Primitive Non-Motorized	1,243,714	50	571,432	23

Table 114. The acres and percent of currently secure grizzly bear habitat suitable for motorized and non-motorized uses

Secure Habitat	Existing Condition Acres	Existing Condition Percent	Proposed Action	Proposed Action
Motorized	349,886	15%	767,582	31%
Non-motorized	2,113,194	85%	1,695,498	69%

Table 115 The secure habitats within Idaho Roadless Rule Areas that Are motorized or Non-motorized by secure habitat block size.

Secure Habitat in Motorize or Non-Motorized Settings By Block Size	Idaho Roadless Rule that are Not Secure Habitat	Secure Habitat Blocks less than 5000 acres in Idaho Roadless Rule Areas	Secure Habitat Blocks between 5,000 and 10,000 acres in Idaho Roadless Rule Areas	Secure Habitat Blocks greater than 10,000 acres in Idaho Roadless Rule Areas	Total Acres of Secure Habitat	Total Area within Idaho Roadless Rule Areas	Percent of Total Secure Habitat Within Idaho Roadless Rule Areas
Motorized	315,098	86,699	47,834	434,458	568,992	884,090	51.18%
Non-Motorized	54,826	17,273	31,645	493,802	542,720	597,546	48.82%
Grand Total	**369,924**	**103,972**	**79,479**	**928,261**	**1,111,712**	**1,481,636**	**100.00%**

Note, all amounts are estimated by a Geographic Information System and are approximate. The complex overlays involved in calculating secure habitat size, that are within the different

The recreation opportunity spectrum settings do not identify where motorized uses would occur specifically; rather they identify where those activities could occur after a site-specific travel management decision. However, the recreation opportunity spectrum settings, in combination with areas identified as recommended wilderness, would largely determine where motorized access could occur under the plan. The alternatives for recreation opportunity spectrum range from the current condition to more motorized access. In the proposed action, the recreation opportunity spectrum can be characterized as more areas suitable for summer motorized use with important areas for non-motorized access delineated because of resource concerns, including for grizzly bear connectivity as shown in figure 51. Thus, several of the areas identified as semi-primitive non-motorized were established to protect wildlife and provide for connectivity. Recreation opportunity spectrum classes have differences in effects depending upon the settings because different recreation opportunity spectrum settings often have different road maintenance levels, which can affect the types of vehicles that can traverse roads and the rate of speed that can be traveled.

Under the proposed action, Management Area 3 would mostly consist of roaded natural setting with less in the rural setting. However, the existing condition did not contain much Rural setting, and so the rural setting increases in Management Area 3 in the Proposed Action. This increase in the rural setting is due to changes in the mapping protocol for the rural setting. The rural setting allows a higher level of development of recreation sites than roaded natural settings. Facilities are designed primarily for user comfort and convenience. These settings are motorized settings where motorized uses are suitable.

The roaded natural setting is managed to provide nodes and corridors of development that support higher concentrations of use, user comfort, and social interaction. The road system is generally well defined in this setting and can typically accommodate passenger car travel. In the semi-primitive motorized setting, the Forest is managed for backcountry motorized use on designated routes. Routes are designed for off-highway vehicles and other high-clearance vehicles. These conditions require lower speeds as well. This setting offers visitors motorized opportunities for exploration, challenge, and self-reliance. Mountain bikes and other mechanized transport are also sometimes present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area or providing portals to adjacent primitive or semi-primitive non-motorized areas. Idaho Roadless Rule areas are typically either semi-primitive motorized or semi primitive non-motorized.

The non-motorized settings would not be suitable for motorized uses and provides other experiences as well. The semi-primitive non-motorized settings includes areas of the Nez Perce-Clearwater managed for non-motorized use. Mechanized transport, such as mountain bikes, may be present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area. These settings are not as vast or remote as the primitive settings, but they also offer opportunities for exploration, challenge, and self-reliance. The primitive setting supports large, remote, wild, and predominantly unmodified landscapes. There is no motorized activity and little probability of seeing other people. Primitive settings are managed for quiet solitude away from roads, people, and development. There are few, if any, facilities, or developments. The primitive settings coincide exclusively with designated wilderness boundaries.

As the recreation opportunity spectrum settings move across the spectrum of ROS settings from primitive to rural, the amount of human activity is expected to increase, the amounts and types of developments increase, and these factors would increase the chance for grizzly-human conflicts. For example, rural settings are the most developed and are present within Management Area 3 while wilderness was assigned to the primitive setting and is the least developed. The location of the recreation opportunity spectrum settings across the Nez Perce-Clearwater are important as well. Grizzly bears are most likely to enter the Forest from the north or the east where they will find recreation opportunity spectrum settings such as primitive and semi-primitive non-motorized. As they move west, they would encounter more semi-primitive motorized and roaded natural settings. Changes in settings under the proposed action also influence the types and intensities of developed recreation sites, trending road development and recreation facilities towards a more developed condition as compared to the existing condition.

The percentage and acres of secure habitat that falls within the recreation opportunity spectrum settings are shown in table 113. The proposed action would include 69 percent of the secure acres in the two non-motorized settings (primitive and semi-primitive non-motorized) and 31 percent of the secure acres in motorized settings table 114.

Several changes would occur in the proposed action compared to the existing condition. Many areas that were formerly roaded natural under the existing plan would be identified as rural in the proposed action due to a change in the mapping protocol versus when the existing condition was mapped. Many areas currently in semi-primitive motorized would become roaded natural under the Proposed Action; this represents a management decision. The greatest change is the amounts of semi-primitive non-motorized settings changing into one of the motorized settings. Semi-primitive non-motorized in the summer is reduced from 33.9 percent down to 16.2 percent. The change mostly occurs within Idaho Roadless Rule areas, however, new roads in these areas are not generally allowed under the Idaho Roadless rule with only limited exceptions. Instead, these would allow motorized trails to be constructed. The total change in the amount of secure habitat from a non-motorized setting to motorized settings is approximately 15 percent in the proposed action (table 114). The areas that change from non-motorized into motorized settings and vice versa are shown in figure 50. Potential connectivity could be impacted would be within Idaho Roadless rule areas in the North Fork Clearwater drainage.

The proposed action includes 417,696 more acres as suitable for motorized use compared to plan direction under the 1987 plan or existing condition. Secure habitats within motorized settings may experience future road or motorized trail development under the plan after site-specific analysis, though where is yet to be determined. Future new developments have the potential to increase the probability of human-grizzly conflict, fragment secure habitat, impair movement and could lead to grizzly bear deaths or removal.

Guideline MA2-GDL-WL-05 constrains construction of motorized trails because it would require that when new motorized trails are developed in Management Area 2, motorized trails should not be authorized unless adjacent areas of 5000 acres or larger can be maintained without motorized access. However, it has three exceptions when it does not apply.

- Community Protection Zones (CPZs) as defined by the Idaho Roadless Rule.
- Areas with existing motorized access that are currently less than 5,000 acres.
- Existing trails that are relocated or reconstructed to mitigate negative impacts to ecological resources.

This guideline would allow limited amounts of motorized trails within secure habitats larger than 10,000 acres within motorized settings within Management Area 2. It would prevent motorized trails from being constructed within secure habitats between 10,000 down to 5000 acres and, then would allow motorized trails within secure habitats smaller than 5000 acres. This guideline would only apply within Idaho Roadless Rule Areas and that are suitable for motorized uses. It would not apply within areas not suitable for motorized uses because there would not be any motorized trails nor roads allowed. Hypothetically speaking, in secure habitats within Idaho Roadless Rule Areas, only blocks larger than 10,000 acres and those smaller than 5000 acres could be divided by a motorized road or trail and still meet the conditions of guideline MA2-GDL-WL-05. Blocks of secure habitat larger than 10,000 acres, blocks between 5000 and 10000 acres, and blocks smaller than 5000 acres in Management Area 2 are shown in figure 52.

A total of approximately 1,111,712 acres of secure habitat are in Idaho Roadless Rule areas. Table 115 shows the acres of secure habitats of different sizes and whether they are suitable for motorized uses or not. Of those, 542,720 acres of secure habitat are totally unsuitable for motorized uses and are protected by suitability plan components. There is a total of 568,992 acres of secure habitat in Idaho Roadless Rule Areas that are in a motorized Recreation Opportunity Spectrum setting. Of those, there are 434,458 acres of secure habitat larger than 10,000 acres, 47,834 acres of habitat between 10,000 and 5,000 acres, and 86,699 acres smaller than 5,000 acres that are suitable for motorized uses. So, 434,458 acres total blocks of secure habitat larger than 10,000 acres could have a limited number of motorized trails developed, 47,834 would be completely protected and 86,699 acres that would have no protections under MA2-GDL-WL-05. Unprotected secure habitats smaller than 5,000 acres make up about 3.5 percent of the total secure habitats in the plan area, and about 7.7% of the secure habitats within Idaho Roadless Rule Areas. figure 52 shows the areas within Idaho roadless rule areas, whether they are in a motorized or non-motorized setting and shows the secure habitats in the various sizes where MA2-GDL-WL-05 apply.

In total, there is 2,463,080 acres of secure habitat, of which 69 percent or 1,695,498 acres of secure habitats are not suitable for motorized uses under the proposed action and would be protected against motorized uses. A total of approximately 767,582 would be suitable for motorized uses. Approximately 482,292 acres of secure habitat would have constraints imposed by MA2-GDL-WL-05 in Idaho Roadless Rule Areas (figure 52). A total of 285,290 acres of secure habitat or about 11.5 percent of the total secure habitats are suitable for motorized uses. Other plan components may exist in those areas to help address motorized uses (see the discussion on how the plan addresses motorized uses below).

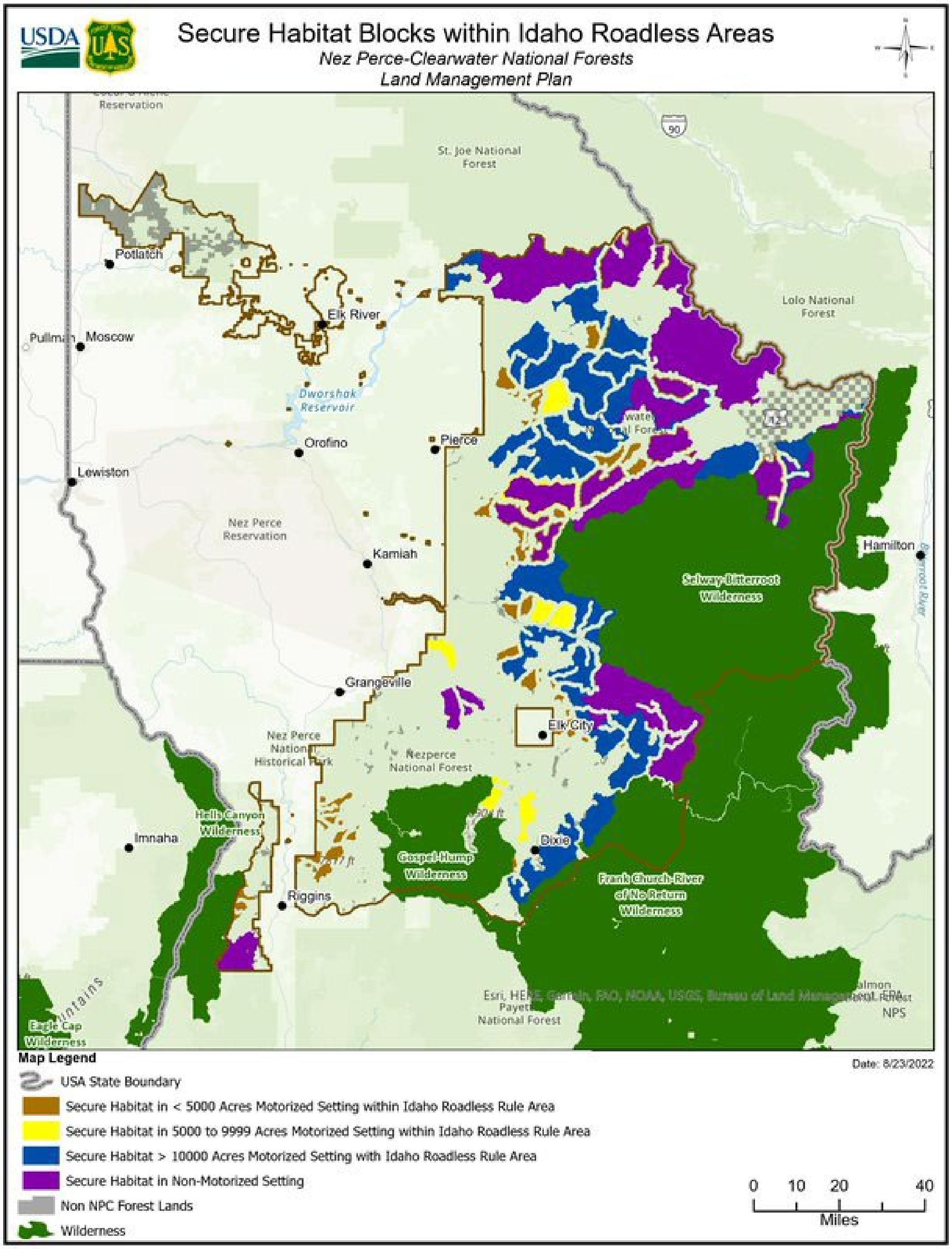


Figure 52. The blocks of secure habitat in Idaho Roadless Rule Areas that are in motorized Recreation Opportunity Settings that are greater than 10,000 acres in blue, between 5000-10000 acres in yellow, and less than 5,000 acres shown as tan. Also shown are Idaho Roadless Rule Areas in non-motorized Recreation Opportunity Spectrum Settings shown in purple. Wilderness areas are shown in dark green. Note, this map does not show secure habitats outside of Idaho Roadless Rule Areas.

The plan area has 26 blocks of secure habitat greater than 10,000 acres (figure 52). They range in size between 1,102,583 and 10,370 acres and combine for a total of 2,180,362 acres of secure habitat in blocks larger than 10,000 acres. The vast majority of the acres in these large blocks are within Management Area 1 and 2 where there are constraints on new roads and motorized trails.

The four largest blocks of secure habitats are centered over wilderness or recommended wilderness areas and include a block over the Selway Bitterroot Wilderness at 1,102,538 acres and surrounding area, a block over the Gospel Hump Wilderness and surrounding area at 274,867 acres, one on the Hoodoo Recommended Wilderness Area and surrounding area at 120,423 acres, and one centered over a portion of the Frank Church River of No Return Wilderness and surrounding area at 108,793 acres for a grand total of 1,606,667 acres. These combined are about 73.6 percent of the secure habitats larger than 10,000 acres. While the majority of these areas are within areas not suitable for motorized uses, some of the secure habitat within these blocks extends over the wilderness boundary into areas suitable for motorized uses. Where they extend is mostly within Idaho Roadless Rule Areas of which some are suitable for motorized uses. This means that, while new roads are not allowed under the Idaho Roadless Rule, these areas could have new motorized trails constructed and still meet MA2-GDL-WL-05 around the periphery of the Wilderness Areas so long as they leave areas 5000 acres and larger after the construction of the new motorized trails.

A total of 76 percent of secure habitats within blocks over 10,000 acres are in a non-motorized Recreation Opportunity Spectrum Classification. That leaves only 24 percent of secure habitats larger than 10,000 acres suitable for motorized uses. About 2 percent are located partially within Roaded Natural settings within Management Area 3, primarily around the Gospel Hump Wilderness Area. In these acres, both roads and motorized trails are suitable with no restrictions. Most of the remaining 22 percent suitable for motorized uses are within Idaho Roadless Rule Areas, mostly in the Backcountry Restoration theme, which prohibits roads with only limited exceptions (See description of Idaho Roadless rule themes in the existing condition section above). All of these acres are located within Management Area 2 where MA2-GDL-WL-05 would apply. Motorized trails would be a suitable use, but new motorized trails would be required to comply with MA2-GDL-WL-05.

The blocks of secure habitat larger than 10,000 acres that occur outside of wilderness and recommended wilderness areas, and within areas suitable for motorized uses, range in size from about 32,747 to 10,370 acres. Most of these large secure areas are located within the Clearwater National Forest in the North Fork of the Clearwater drainage, but also occurs within other areas around wilderness areas. In some cases, adding only one or two motorized trails would render them between 5,000 and 10,000 acres wherein they would be unable to accommodate any other motorized trails and still meet MA2-GDL-WL-05. So, they would be limited in the total amount of motorized access that could occur. Figure 52 shows a map of the areas that are suitable for motorized uses in Idaho Roadless rule where MA2-GDL-WL-05 applies.

Keep in mind that there would still be an additional 47,834 acres more that meet the definition of secure habitat but that are smaller than 10,000 acres but larger than 5000 acres. These habitats would be protected by MA2-GDL-WL-05. Secure habitats 1280 acres (or 2 square miles) or larger were identified by Wakkinen and Kasworm (1997) as areas more likely to be used by grizzly bears than smaller areas. Wakkinen and Kasworm (1997) also showed that grizzly bears used areas as small as 141 acres but less frequently. There will be about 70,676 acres of secure habitats less than 5,000 acres but more than 1280 acres in Management Area 2 that are in a motorized setting and where motorized trails would be allowed. Guideline MA2-GLD-WL-05 would not apply to these secure habitats. This amounts to 2.86 percent of the total secure habitats within the plan area. Guideline MA2-GLD-WL-05 is only required to apply within Management Area 2 and therefore will not protect secure habitats within Management Area 3. Any new motorized roads or trail constructed within 500 m of existing motorized routes would result in a loss of additional secure habitat. Reductions in secure habitat would increase the probability of bear-human conflicts, and bear deaths as they move into the area. While the location, amount and length of new motorized roads and trails are unknown, it is reasonable to expect that new motorized roads and trails would be constructed occasionally throughout the life of the plan. There would likely be new motorized trails constructed within blocks of secure habitat larger than 10,000 within motorized Recreation Opportunity Spectrum Settings suitable for motorized uses but the amount of these would be limited by guideline MA2-GDL-WL-05 in Idaho Roadless Rule Areas. In a worst-case scenario, a portion of the secure habitats in motorized settings in Management Area 2 larger than 10,000 acres could be reduced in size down as small as 5,000. However, these habitats should still remain with low motorized route density overall and would still remain permeable to grizzly bears. Larger secure habitats are more valuable than smaller secure habitats in terms of their ability to provide for grizzly bear dispersal and occupancy and the very largest secure habitats centered around wilderness areas and recommended wilderness areas would mostly remain intact because most of those areas are not suitable for motorized uses.

The location and amount of secure habitat impacted by motorized trails that would be constructed in secure habitats smaller than 5,000 acres in MA2 is not known, and there is no projection as to how much secure habitat would be reduced within the life of the plan. In total the maximum would be determined by the precise alignment and in what manner new motorized trails cross secure habitats. These can only be determined after site specific analysis, which would also include an ESA consultation.

While a useful indicator, it should be noted that blocks of secure habitat are delineated based solely on the presence or absence of roads and motorized trails, but are not otherwise delineated as meaningful unit of measure per se. Other factors may also matter to grizzly bears, such the landscape arrangement of blocks of secure habitats, the amount of use and speed of the motorized routes, or habitat conditions such as nutritional resources, or other factors.

It is reasonable to expect that decisions in the plan on motorized suitability will allow a potential increase in motorized access and a loss of secure habitat over time within the plan area. Increased motorized access would bring people into proximity with grizzly bears once they move into the plan area. With an increase in people comes an increase in bear attractants that could draw grizzly bears into proximity of people leading to more bear human conflicts as grizzly bears become established. Thus, the increase in motorized uses will increase the probability of bear-human conflicts, leading to increased probability of mortality and decreased habitat. Because grizzly bears avoid motorized routes and smaller secure habitats, a decrease in the size of large secure habitats, and small secure habitats could reduce the permeability of the landscape for grizzly bears. However, the distribution of protected secure habitats occurs along the Idaho-Montana border, an area that has been identified as important to grizzly bear connectivity (Peck et al. 2017). The scope of the impacts is within the distribution of secure habitats suitable for motorized uses. Therefore, about 31 percent of the secure habitats within the plan area could be impacted by motorized uses. This represents 767,582 acres of secure habitats. Keep in mind that 1,695,498 acres of secure habitat are protected because they are not suitable for motorized uses.

The addition of a few additional motorized trails will still leave these large secure habitats permeable to grizzly bears to provide connectivity. Grizzly bears have been documented moving through and using landscapes with more roads and motorized trails than those in Management Area 2. This guideline, along with the restrictions in the Idaho Roadless Rule would conserve these areas sufficiently to provide connectivity and likely even the ecological conditions to support occupancy of grizzly bears outside of the Recovery Zone. Consider that the total amount of secure habitat in blocks of habitat 10,000 acres and larger (2,180,362 acres) is almost the size of Yellowstone National Park (2,221,766 acres). It is hard to argue that bears could not survive and experience population growth on the Nez Perce Clearwater landscape with these characteristics, even if more motorized trails are constructed under the constraints of MA2-GDL-WL-05. These areas would clearly allow passage for connectivity.

The plan does not make site specific decisions to authorize any roads nor motorized trails. Instead, the proposed action only identifies where such uses are suitable and thus represents only the potential areas where this use could occur. The location, layout, direction, length and change of secure habitat from new motorized roads or trails is unknown because these decisions have not yet been made and cannot be anticipated. The change in secure habitat from future roads or motorized trails will depend on their layout, where and in which direction they cross the block of secure habitat, their length and their straightness. Decisions on motorized trails would require site specific analysis on the location, layout, and distribution of future trails, and would undergo site specific NEPA analysis and Endangered Species Act consultation prior to construction.

The effects of motorized trail use on grizzly bears has not been well studied as the focus of most studies are on the effects of roads. There may be differences in effects from motorized trail recreation compared to roads. For example, camping from motorized trails is less common than camping near roads. Motorized trail users tend to ride loops or paths as the activity of interest itself rather than traveling to a destination as is more common with road use. So, the effects of motorized trails may not have the same impacts as roads from a human-bear conflict standpoint. On the other hand, loops are often more attractive to OHV recreational riders than endpoint destinations because they want to see different scenery across their trek instead of seeing the same landscapes twice. So, loops often become popular attractions for OHV users. In either case, they would still result in displacement and would still potentially result in human-bear conflicts.

Permanent and temporary roads may be built in the multiple use Management Area 3, where grizzly bear presence is neither biologically suitable nor socially acceptable. Within the Idaho Roadless Rule portion of MA2, the construction of new roads is constrained, but does not restrict new motorized trails. In the non-Roadless Rule portions of Recommended Wilderness and to a limited extent in other MA2 designations, roads are unsuitable. In some areas of non-Wilderness MA1 roads and motorized use are suitable. In the Wilderness Area portions of MA1 all roads are unsuitable. This combination of road and motorized use allowances and restrictions would contribute to grizzly bear recovery in the majority of the Forest, including nearly all of the Recovery Zone.

It should be understood that the recreation opportunity spectrum settings were not used in the 1987 plans as a mechanism to determine suitability for motorized uses. Instead, the 1987 plans used direction from elk objectives to identify the appropriate density of motorized roads and trails on the Nez Perce-Clearwater. Once the Idaho Roadless Rule was enacted it set restrictions on road building on much of the Forest, particularly those with high levels of elk habitat effectiveness. The need for elk measures to constrain road building were thus replaced by Idaho Roadless Rule Areas. Idaho Roadless Rule restricted road building on many areas across the forest, some of which would be considered suitable in the proposed action. Therefore, the recreation opportunity spectrum under the 1987 forest plans is not directly comparable with the recreation opportunity spectrum proposed under the revised plan. The amount of area closed to motorized uses under the 1987 plans equaled about 55.3 percent of the Nez Perce-Clearwater as shown in table 112.

The proposed action does not contain a similar or alternative mechanism (such as standards or guidelines) that impose restrictions similar to elk habitat effectiveness standards. The plan instead enforces direction within management areas via suitability plan components and includes a guideline (MA2-GDL-WL-05) designed to maintain secure habitat instead of the elk habitat effectiveness measures. The suitability plan components in conjunction with the Guideline MA2-GDL-WL-05 provide a different mechanism to provide the ecological conditions for grizzly bear. The two mechanisms are not directly comparable for a number of reasons:

1. Suitability plan components are a new type of plan component that did not exist in the 1987 forest plans. ROS was not used as a zoning tool in the 1987 forest plans, rather it was a mapping exercise based on other layers of direction, including EHE and travel plan decisions.
2. The elk habitat effectiveness is based on motorized features within a delineated unit boundary while guideline MA2-GDL-WL-05 is unitless. It is directed at maintaining secure habitat itself rather than imposing limits on some level of motorized routes within a delineated unit. The secure habitat guideline does not rely on a delineated unit and is defined only by delineating areas without motorized routes, defined as areas farther than 500 m (0.31 miles) of a motorized route. Therefore, it is a unitless metric which can be analyzed without delineated units. The guideline ties instead specifically to the size of the secure habitat rather than being measure relative to a delineated unit. Therefore, is not directly comparable to a unit-based indicator like elk habitat effectiveness.
3. They operate differently. The elk habitat effectiveness standards in the 1987 plans allowed motorized routes so long as the at the end of the project, the elk habitat effectiveness within the elk analysis unit remained below the elk habitat effectiveness objective. If the elk habitat effectiveness objective was low enough (25 and 50 percent for example), and the roads were spaced out evenly, it left little to no secure habitat in many cases (compare elk habitat effectiveness objectives figure 38 with secure and not secure habitat shown in figure 39 for a visual comparison). A good example of the outcome of this management can be understood by an examination of the current distribution of secure habitat within areas managed for multiple uses (typically 25 percent or 50 percent elk habitat effectiveness areas). Baseline conditions in multiple uses areas contain little secure habitat even though they would have been required to meet either 25 percent or 50 percent elk habitat effectiveness objectives. In contrast, suitability plan components identify common forest service activities that are either suitable, not suitable or conditionally suitable. When not suitable or conditionally suitable, they impose sweeping restrictions that apply to the whole land allocation or management area.
4. The two mechanisms operate at different scales. While the elk habitat effectiveness objectives applied across most of the Forest, the requirements for elk habitat effectiveness were applied at the elk analysis unit scale which where delineated to represent area approximately equal the average size of an elk home range, which were relatively small. For example, the average size of elk analysis units are close to 5,200 acres (based on the elk analysis unit ArcGIS layer).

The two mechanisms differ in spatial extent, often with different confounding underlying management direction. Management areas direction was more complicated under the 1987 forest plan and resource emphasis was different for different areas. The proposed plan simplified the broad management areas into three general types. Furthermore, the boundaries of the land allocations within the proposed action don't align with the boundaries of the elk habitat effectiveness units. Also, the Idaho Roadless Rule was not established until 2008 which complicates the comparison with the 1987 forest plan direction. The distribution of Idaho Roadless Rule doesn't match the boundaries of habitat effectiveness objectives. So, comparing a spatial overlay of the land allocations within the proposed plan compared with the 1987 elk habitat effectiveness layers would produce complicated alignment problems and topological errors that might not be easy to understand. Such a comparison would result in 4 categories of elk objectives overlayed on the five categories of Recreation Opportunity Spectrum and the 5 Idaho Roadless Rule themes resulting in complex overlay combinations of categories. So, the overlay was not quantified for this analysis. Suffice it to say the mechanisms are different, and the proposed direction would have more protections for secure habitat in some areas and less in other areas compared to the 1987forest plans. The table below attempts to qualitatively illustrate the differences.

Table 116. A comparison of measures that address motorized access in the revised forest plan compared to the direction in the 1987 forest plans.

Land Allocation in the Proposed Action	Whether the protections for secure habitat are more protective, less protective, or equally protective	Reason	Projected future outcome of the Proposed Action
Management Area 3-Managed for Multiple Uses	Less protective	Most of management area 3 included some motorized restrictions of either 25 or 50% elk habitat effectiveness objectives in the 1987 plans but have few constraints on motorized uses in the proposed plan.	New roads and motorized trails would be easier to build, and motorized access is expected to increase, however, the need to increase roads is limited because the road system required to effectively administer the forest already reaches most of management area 3 (see travel management in the description of the proposed action above)
Management Area 2-Recommended Wilderness	More Protective	Motorized uses are not suitable in recommended wilderness. Most were 100% EHE objectives but the meadow creek recommended wilderness area includes areas that were 75% and 50% EHE areas.	Some existing motorized routes will need to be closed because of the new meadow creek recommended wilderness area. No new motorized roads and trails are expected to be constructed in those areas though the plan has limited exceptions to the constraints consistent with Idaho Roadless Rule regulations.
Management Area 2-Idaho Roadless Rule Areas	Less protection	Roads are suitable only under limited circumstances in most of the Idaho Roadless Rule Areas. However some Idaho Roadless Rule Areas had standards requiring 100% Elk habitat effectiveness be maintained. Areas with 75% EHE standards still allowed some motorized routes while 100% EHE objectives heavily restricted or prevented motorized routes. In the proposed plan, some areas with a 100% EHE requirement standard will be motorized in the proposed plan. Specifically, these include west meadow creek, the Rackliff-Gedney, Moose Mountain, and Bighorn-Weitas Roadless Rule Areas, and as a result will have less protections	New roads would be very limited in Roadless Rule Areas but still possible depending upon theme and exceptions in the Idaho Roadless Rule Regulations. Some new motorized trails are expected to be constructed resulting in some loss of secure habitat. However, they are expected to be limited by MA2-GDL-WL-05 which will help to conserve large secure habitats.

Land Allocation in the Proposed Action	Whether the protections for secure habitat are more protective, less protective, or equally protective	Reason	Projected future outcome of the Proposed Action
		because of the change. However, guideline MA2-GLD-WL-05 would apply, offering some protections.	
Management Area 2-Research Natural Areas	More protected	Research Natural Areas are not suitable for motorized travel. The plan proposes several new Research Natural Areas.	No new motorized routes are expected within Research Natural Areas.
Management Area 2-Eligible and Suitable Wild and Scenic Rivers	Variable but similarly protective	The plan proposes fewer suitable or eligible wild and scenic rivers. Most formerly eligible rivers that will not be suitable in the proposed action were wilderness areas or Idaho Roadless Rule Areas which affords them some protections. Plan components that guide suitable and eligible wild and scenic rivers are similarly protective. Many of these river corridors overlap with Idaho Roadless Rule Areas, recommended wilderness or designated wilderness Areas also.	A few new motorized trails or roads could be constructed in scenic or recreational rivers, but not in wild classifications. If the rivers overlap with other land allocations such as Idaho roadless Rule or Wilderness, they would be required to follow suitability components and applicable guidelines for those areas as well.
Management Area 1-Designated Wilderness	Similarly protective	Roads and Motorized Trails are not suitable in Designated wilderness.	No motorized routes are expected to be constructed in designated wilderness.
Management Area 1-Designated Wild and Scenic Rivers	Similarly Protective	While direction specific to Designated Wild and Scenic Rivers is similar in the proposed action compared to the existing condition, most of the river corridors were winter range that did not have elk habitat effectiveness objectives. Part of the Selway and Salmon River are designated wilderness.	Steep terrain and the protections of the Wild and Scenic River Act and designated wilderness are expected to limit new motorized roads and trails.
Management Area 1-The National Historic Landmark.	Similarly protective	This management area occurs concurrent with Idaho Roadless Rule areas and so it had 50% and 100% EHE objectives. Idaho Roadless Rule regulation apply, and so would MA2-GDL-WL-05.	Management is similar in the national historic landmark in the proposed action compared to the existing plans.

Effects of Winter Recreation Opportunity Spectrum and Suitability

Winter recreation is thought to be less impactful to grizzly bears. There are no known studies that have documented or evaluated the impact of winter recreation on denning or hibernating grizzly bears directly. Instead, researchers and managers have speculated that motorized winter recreation could disturb hibernating grizzly bears and modeled the potential overlap of potential denning areas and snowmobile use as a way to estimate and minimize potential impacts, for example as in Podruzny et al. (2002).

Winter motorized recreation includes snowmobile use, 4-wheelers with winter tracks, snow bikes and any other motorized vehicles designed for use over snow. The primary concern for effects would be if recreational activities cause disturbance or abandonment of dens and especially, females with cubs. The other concern would be if recreationalists encounter a female grizzly bear emerging from her den with cubs while recreating leading to conflict.

The revised forest plan would not open areas to winter motorized vehicles; instead, it identifies areas suitable for winter motorized recreation, which could be opened after site specific analysis. Authorization of winter motorized uses would be determined in a future travel management decision under the guidance of the Forest. These types of decisions identify areas open for motorized winter recreation. They may include decision on specific winter motorized routes, parking lots, and whether routes are groomed as well. Most likely, areas suitable for motorized winter recreation would be opened for motorized winter recreation in the future.

Areas suitable for winter motorized uses are made in the revised forest plan through Winter Recreation Opportunity Spectrum Settings and Suitability plan components. These decisions dictate not only whether the activity is suitable, but also guides the management of the land to provide a specific recreational experience that is influenced by the level of development. Winter motorized recreation would be unsuitable in two Winter Recreation Opportunity Settings while motorized winter recreation would be suitable in three other settings. Motorized recreation would be suitable in Semi-Primitive motorized, Roaded Natural and Rural settings, while it would be unsuitable in primitive and semi-primitive non-motorized settings. Figure 53 displays the winter recreation opportunity spectrum settings under the proposed action. Note that most of the forest is suitable for winter motorized use except the designated and recommended wilderness areas.

Suitability plan components also identify whether winter motorized uses are suitable or not and are compatible with the Winter Recreation Opportunity Spectrum settings. Table 117 compares the percent of the forest in winter recreation opportunity spectrum settings in the proposed action to the existing condition. The proposed action increases the area suitable for winter motorized recreation and decreases the areas that are not suitable for winter motorized recreation. The areas suitable for winter motorized recreation increases from 39 percent up to 60 percent, while areas not suitable for winter motorized uses decreases from about 61 percent down to about 40 percent. A map of the winter Recreation Opportunity Spectrum is shown in figure 53. Most of the forest would be in the semi-primitive motorized setting.

Table 117. Percent of the Plan Area within Winter Recreation Opportunity Settings under the existing conditions in the 1987 forest plans and under the proposed action

Winter Recreation Opportunity Spectrum	Existing Condition	Proposed Action
Primitive	25	29
Semi-primitive non-motorized	36	11
Semi-primitive motorized	16	54
Roaded natural	23	6
Rural	0	0

Motorized winter recreation is not suitable within recommended wilderness and designated wilderness, and therefore would not be allowed under the plan. Therefore, the majority of the Bitterroot Recovery Zone is not suitable for motorized winter recreation and would not be allowed under the plan. Recommended wilderness areas would provide additional areas without winter motorized uses to contribute to connectivity into the recovery area because recommended wilderness areas are outside the recovery zone. Winter motorized uses are unsuitable in recommended wilderness areas and would not be allowed. Recommended wilderness would provide areas without this activity for dispersing bears and would maintain ecological conditions for a grizzly bear population.

The number of people participating in winter recreation in the plan area is likely to increase in the future as the population in surrounding communities grows, and as more people obtain motorized winter recreation equipment. Most winter motorized recreation is from snowmobiles but snow bikes, and off highway vehicles equipped with snow tracks are also used. The advent of motorized snow bikes has improved motorized winter recreation technology that could potentially increase the area of use Snow bikes are narrow, light, and much easier to turn, which lets users go where snowmobiles simply can't, cutting through dense trees. While more of the forest will be suitable for winter use under the proposed action, any new winter motorized recreation will only be authorized after a site specific NEPA analysis and Endangered Species Act consultation. And even where winter uses are authorized, winter recreation would not be distributed evenly on the landscape. There tends to be more use where there are roads for access and groomed trails. Also use would be higher where there is rolling or flatter terrain.

As a reminder, the 1987 forest plans did not use Winter Recreation Opportunity Spectrum settings to identify whether nor where motorize uses are suitable. Instead, Winter Recreation Opportunity Spectrum settings under the existing 1987 forest plans was a way to guide management of the land to provide a variety of recreational experiences. Therefore, Winter Recreation Opportunity Spectrum Settings in the existing condition do not reflect suitability of winter motorized uses in the 1987 plans. Prior to the Clearwater Travel Plan, winter motorized uses were allowed across the whole forest unless closed by site specific decisions such as in those that closed designated wilderness areas or other site-specific closures. The Clearwater Travel plan closed winter motorized uses in recommended wilderness but allowed it everywhere outside of recommended wilderness. Because there is no designated wilderness within the Clearwater National Forest, the Clearwater Travel Plan did not address winter motorized travel in wilderness. In contrast, the Revised Forest Plan under the proposed action does use the Winter Recreation Opportunity Spectrum settings to establish motorized suitability, so it is different than how it was used in the 1987 plans. Therefore, the proposed action for Winter Recreation Opportunity Spectrum changes both the motorized suitability and the emphasis on providing a range of recreation experiences. The existing condition is that motorized winter recreation is currently allowed in most of the forest where it is not specifically closed and use is currently occurring in many areas especially those proximate to the groomed winter recreation features.

The proposed action would identify the area suitable for winter motorized uses, which could lead to more designated future motorized winter recreation use trails or areas. Keep in mind that winter motorized uses require a subsequent travel planning decision to designate areas open for winter motorized uses after they are identified as suitable. Areas not suitable for winter motorized uses can't have winter motorized uses authorized in areas identified as unsuitable for winter motorized use in the plan. If winter motorized uses are authorized, they could have increased probability that grizzly bears are disturbed in their dens and increase the probability that emerging females could encounter winter recreationalist. However, this type of disturbance is a non-issue without current occupancy, and will likely be an uncommon event once occupied based on the infrequent or rarely documented den disturbance in other recovery zones.

The plan contains FW-STD-WL-01 which requires that the Northern Rockies Lynx Direction would be followed. The Northern Rockies Lynx Direction includes forest plan Guideline HU G11 which directs that over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction. The Northern Rockies Lynx Direction is required to be followed in areas considered to be occupied by lynx which currently includes the Clearwater National Forest. This direction would prevent new winter motorized uses in lynx habitat within many of the larger secure habitats of the Clearwater National Forest. The Record of Decision for the Northern Rockies Lynx Direction states that "When National Forests are designing management actions in unoccupied mapped lynx habitat they should consider the lynx direction, especially the direction regarding linkage habitat." Because the Nez Perce National Forest is currently considered unoccupied by lynx, the forest would need to consider the direction in the Northern Rockies Lynx Direction. This direction would help address impacts to grizzly bear denning habitat.

The Clearwater Travel Plan (U.S. Department of Agriculture 2011b, U.S. Department of Agriculture 2017) considered and abided by Guideline HU G11, which states over-snow routes should not expand outside baseline areas of consistent snow compaction. The Clearwater National Forest Travel Plan identified 115 miles of baseline motorized snow routes and authorized no expansions in over-snow routes. The Nez Perce National Forest has not yet undergone winter travel planning and is currently open to all winter motorized activities except in areas closed to winter motorized uses.

Linnell (2000) documented both den abandonment and tolerance of disturbance in brown bears (grizzly bears) and that bears appear to be undisturbed by most activities that occur at distances greater than one km. Activity closer than one km and especially within 200 m has variable results, with some bears tolerating activity right up to the den.

Some evidence suggests that there may be spatial separation between where winter recreationists choose to recreate and where denning grizzly bears tend to select for dens. Grizzly bears tend to den in areas at high elevations, on steeper slopes, under tree canopy, and relatively far from developed areas or human activity (Craighead and Craighead 1972, Linnell et al. 2000). They avoided valley bottoms, exposed ridge tops and high peaks (Linnell et al. 2000). Linnell (2000) reported that grizzly bear winter dens tend to be located on steep terrain of between 30-50 degrees, at higher elevations and under tree canopy. Olson et al. (2017) studied factors selected by GPS-equipped of winter recreational users. Snowmobilers riding off trail selected areas for ease of access, reflected in proximity to highways and densities of open forest roads, with lower canopy cover, and smoother, less steep terrain (Olson et al. 2017). On-trail snowmobilers selected for greater forest road density, moderate annual precipitation, and lower terrain variability, and moderate levels of snow, shallow slopes, and higher elevation (Olson et al. 2017). Slopes used averaged between 14.7 to 16.28 for motorized winter users, and canopy cover was between 33.88 to 37.88 percent (Olson et al. 2017). Therefore, winter recreators are less likely to use the same areas as grizzly bear dens because of the avoidance by snowmobilers of steep slopes and tree cover. While overlap of motorized winter recreation and potential grizzly bear den sites undoubtably occurs, the tendencies of both grizzly bears and winter recreational users might provide some partitioning of areas used that reduces overlap.

Snowmobile selection potential was modeled by Lucretia Olson within the Nez Perce-Clearwater National Forests and is shown in figure 54. This figure estimates where snowmobilers are likely to prefer using based on terrain, slope, vegetation, and other factors. It does not reflect where winter recreation is open for use nor where it is actually occurring. The model was created based on parameters obtained from user data from Colorado and applied to Idaho landscapes and standardized to Idaho conditions. Once developed, it was validated by data from user groups from Idaho and Montana. Additional validation was verified by recreation specialists who work on the Nez Perce-Clearwater National Forests and are familiar with known use patterns.

Olson et al. (2017) modeled terrain selection of motorized and non-motorized winter recreationists, including snowmobile, backcountry ski, and snowmobile-assisted hybrid ski. They used GPS systems carried by winter recreationists to determine use selection of remotely sensed environmental characteristics, including topography, vegetation, climate, and road access. Model results indicated that motorized and non-motorized activities select different environmental characteristics. Both motorized and non-motorized winter recreationists selected for ease of access, reflected in proximity to highways and densities of open forest roads. Areas predicted to have only motorized recreation were more likely to occur further from highways, with greater forest road densities, lower canopy cover, and smoother, less steep terrain, while areas with only non-motorized recreation were closer to highways, with lower forest road densities, more canopy cover and steeper terrain. Snowmobiles using trails selected areas that had greater forest road density, moderate annual precipitation, and lower terrain variability. Off-trail snowmobiles users selected moderate levels of snow, shallow slopes, and higher elevation.

A stronger response to vegetation covariates at a small scale suggests that recreationists select areas in which to recreate at a hierarchical scale, with road access and large topographic features dictating an initial area selection, and finer scale features such as forest density determining where to move within this area. The greater influence of vegetation at a small spatial scale may be related to the differences in movement speed and maneuverability of the different recreation types, since non-motorized recreationists may be better able to safely move through dense trees, while motorized recreationists may select open areas for play and fast travel.

Grizzly bears in contrast are known to select steeper slopes with some canopy cover. Linnell (2000) reported that mean slopes of brown bear (grizzly bears) dens were between 30–50-degree slopes (57.73-119 percent slope). Mace and Waller (1997) reported that grizzly bear dens averaged 63 percent slope. and that grizzly bears denned in open timbered, and timbered habitat as well as open habitats. According to Olson (2017) the average slope for motorized winter recreational use was about 9 degrees, which is much less steep than grizzly bear den preferences reported by Linnell (2000), and Mace and Waller (1997). While the average is 9-degree slopes, some winter motorized recreationalists seek out steeper areas for hill climbing and high marking, so some overlap occurs.

Generally, bears select dens one to 2 km from human activity (roads, habitation, industrial activity) and seemed to tolerate most activities that occurred more than one km from the den (Linnell et al. 2000). Olson (2017) in contrast reported that winter motorized users tended to select areas with higher road densities and more access.

Average percent canopy cover reported by Olson (2017) for motorized winter recreational users was about 28 percent. Mace and Waller (1997) reported that grizzly bears denned in open timbered, and timbered habitat as well as open habitats. Mace and Waller (1997) classified canopy cover as open when it had less than 40 percent canopy cover, open timbered between 41-60 percent canopy cover, and timbered when >60 percent. They found that 40 percent of grizzly bears denned in open, while 43 percent denned in open-timbered timbered habitat and 17 percent denned in timbered habitat. This means that those in open timbered habitats have higher canopy cover than the average amount of canopy cover used by motorized recreationalists, but some grizzly bears use areas with canopy characteristics similar to those preferred by winter motorized users. Based on the preferences, there appears to be some separation in use of space between motorized winter recreationalists and where grizzly bears prefer to den. The differences mostly appear to be in their preferences for slopes wherein there is little overlap in where winter motorized users select and where grizzly bears select. Vegetation characteristics may also prevent some use of motorized winter recreation in areas where grizzly bears den. However, winter recreation is also widespread and overlap of uses probably will occur within potential denning habitats. Keep in mind that the Bitterroot Recovery Zone is not suitable for motorized winter recreation and thus it would not be allowed there under the proposed action. Therefore, the effects from motorized winter recreation is limited to areas outside of the recovery zone.

Concern has been raised that disturbance from winter recreation, and especially motorized over snow recreation could potentially adversely affect grizzly bears shortly before or after den emergence of a female with cubs. Females and their cubs remain in the den site area for several weeks after emergence from dens (Mace and Waller 1997). Females with cubs have high energetic needs, and cubs have limited mobility for several weeks after leaving the den. Disturbance levels that cause a female to prematurely leave the den in spring or move from the den area could impair the fitness of the female and safety of the cubs. If cubs attempt to follow their mother, they will likely experience decreased fitness and the family group may be pushed to less suitable habitat. Late season snowmobile use is not restricted under the plan, and extended winter motorized use seasons (after April 1) could occur.

While a conflict like this is possible, it is a low likelihood event for the following reasons. Winter recreation drops off sharply as the snow melts. Winter trail grooming on the forest begins on around December 1st and ends March 31st and use drops off sharply after grooming ends. Bears in contrast emerge from their dens typically in April in Idaho and Western Montana (Linnell et al. 2000). Females with cubs of the year are the last to leave den sites and some may remain in the vicinity of the den until the snow has disappeared (Craighead and Craighead 1972, Linnell et al. 2000). Snow melts unevenly in spring, leaving patches of snow in some areas while it melts in other areas. People are reluctant to navigate those conditions with motorized over-snow vehicles because they are reluctant to drive across dirt and mud trying to access the next snow patch. While snow melts later in the season at higher elevations, there are often challenges for people accessing those areas because of muddy roads, snow drifts, downed trees across roads, and other seasonal hazards that tend to keep people out of high elevation areas in spring. There are no known grizzly bear denning sites within the action area. To date, litter abandonment by grizzlies due to snowmobiling activity has not been documented in the lower 48 States (Hegg et al. 2010).

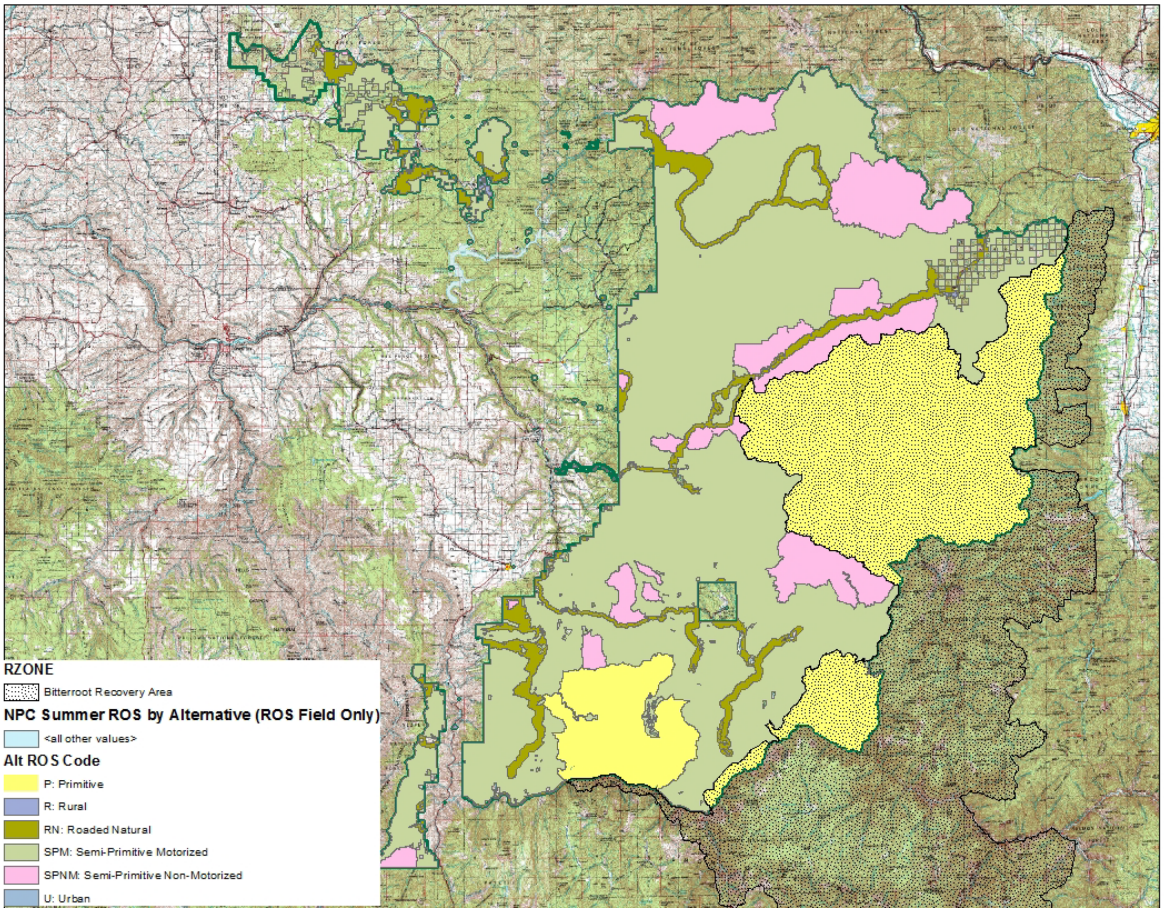


Figure 53. The winter Recreation Opportunity Spectrum settings in relation to the Bitterroot Recovery Zone. Primitive and Semi-Primitive Non-motorized are the Non-motorized settings. Motorized settings include the Urban, Rural, Roaded Natural and Semi-Primitive motorized

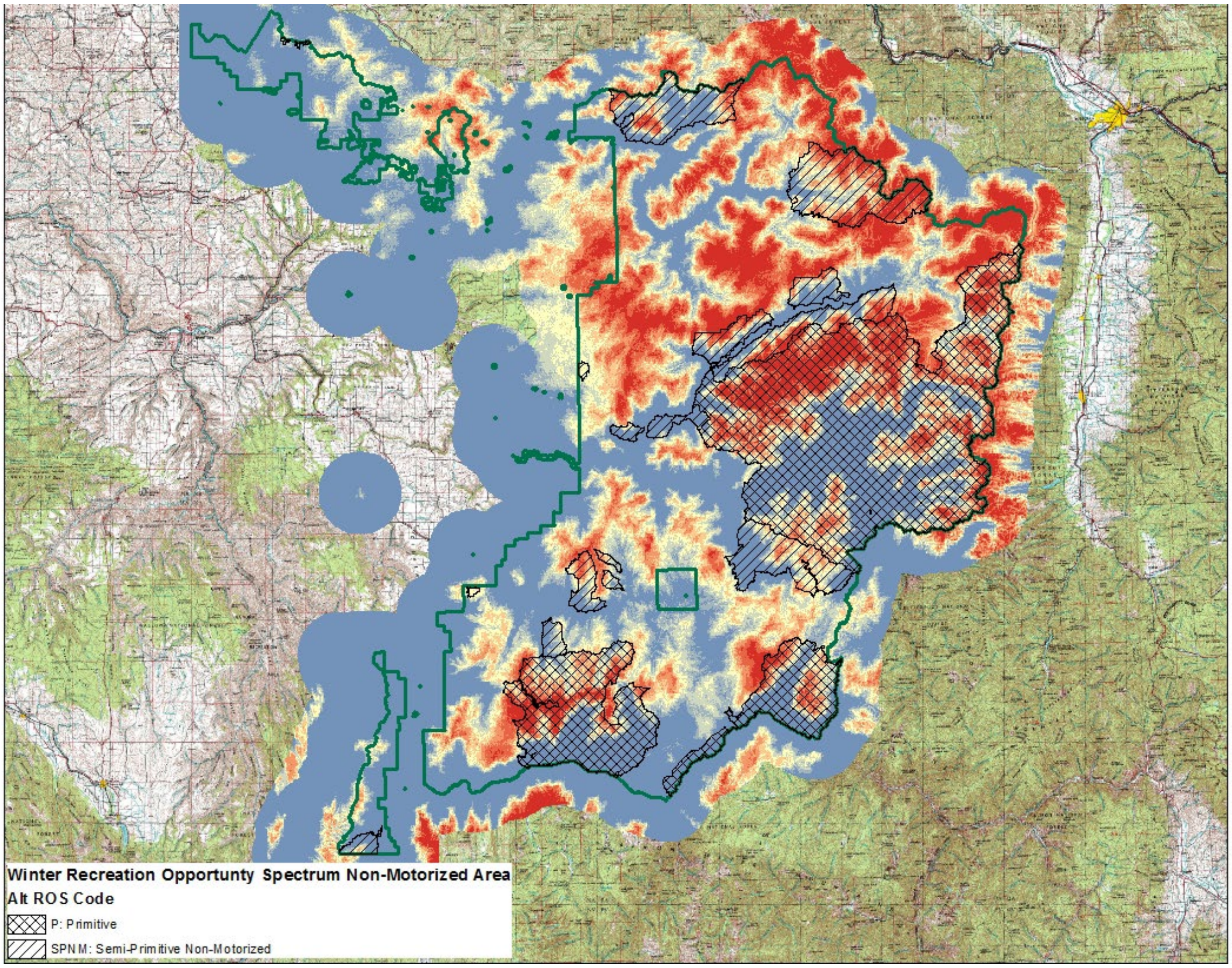


Figure 54. The Idaho Standard off road Snowmobile model developed by Lucretia Olson to estimate snowmobile user selection on the Nez Perce-Clearwater National Forests. Warmer colors represent areas where snowmobilers are predicted to select to use, where cooler colors represent areas snowmobilers might not select based on user preferences from Colorado. Crosshatched and line shaded areas would be non-motorized for winter recreation under the proposed action

Effects of Airplane and Helicopter Use

The Revised Forest Plan will not make any decisions to authorize, nor close aircraft use and also does not make decisions to authorize nor close backcountry airstrips. Also, it will not change ongoing aircraft use. Instead, under the Proposed Action the Revised Forest Plan will provide plan components to guide future authorization of aircraft and helicopter use. Decisions on the establishment, maintenance, reauthorization or closing of backcountry airstrips, would require site specific environmental analysis and Endangered Species Act consultation.

Airplane and helicopters operated by the public and administratively may land at the backcountry airstrips as an ongoing activity. The public typically doesn't land aircraft anywhere in the Forest outside of these airstrips unless they receive authorization through a permit. The use of backcountry airstrips could have some displacement effects and brings some people into backcountry areas within the Recovery Zone.

The land allocations under the revised forest plan influence where aircraft use may occur. Aircraft use within wilderness includes emergency situations or also happens where the agency has undertaken a minimum requirements analysis, NEPA and Endangered Species Act consultation to authorize such use in wilderness areas. State of federal agencies sometimes request authorization to use aircraft in wilderness for research or wildlife management purposes. These also require a minimum requirements analysis and authorization.

The plan identifies aircraft use within Recommended wilderness as suitable and thus allowed for administrative uses, but recreational uses are not suitable and would not be allowed. Administrative uses related to management responsibilities, including by other federal and state agencies in coordination with the Nez Perce-Clearwater and includes research, monitoring, aircraft landing including unmanned aircraft would be suitable in recommended wilderness. Emergency aircraft use and administrative aircraft use is not expected to be recurrent and will occur as dispersed and infrequent disturbances.

Outside of wilderness and recommended wilderness, there are no restrictions on administrative or emergency use of aircraft in the plan. The Forest Service may authorize such uses in response to emergencies or for administrative purposes without environmental analysis or consultation. Aircraft use by other state and federal agencies also can occur after authorization and coordination with the Forest Service.

Aircraft uses may also be authorize for operators or the public. For example, authorizations have occurred for aerial timber harvest, commercial uses, or for any other uses requiring aircraft. Generally speaking, helicopter logging does not pose the same long-term displacement effects and increased mortality risk to grizzly bears as roads do. Helicopter logging is transitory and does not bring additional human use into grizzly bear habitat, whereas roads are generally longer term or permanent features on the landscape and facilitate human access into grizzly bear habitat. Helicopter logging may, however, result in short-term adverse impacts to grizzly bear core habitat because the ability of the area to function as grizzly bear core habitat is compromised, and grizzly bears are likely to be displaced from the area during the time the helicopter logging operations are on-going. Thus, while helicopter logging within grizzly bear secure habitat may not necessarily result in a long-term loss of secure habitat (unlike road construction within grizzly bear secure habitat), the potential temporary adverse displacement effects to grizzly bears associated with helicopter logging within grizzly bear core habitat must be considered. Under the proposed action, helicopter or areal logging systems are anticipated to continue to be used within Management Area 3 and within Management Area 2, especially when resource concerns, such as impacts to soils, aquatic resources or wildlife are accounted for in projects. Areal logging projects are evaluated on a case-by-case basis when analyzing projects and must undergo site specific analysis and Endangered Species Act clearances.

The revised forest plan has only a few plan components that guide air travel or helicopter use. Desired condition FW-DC-INF-04 says:

> *"Airstrips serve the Nez Perce-Clearwater land management and public recreation opportunities. The seven existing public backcountry airstrips for airplane and helicopter access to the Nez Perce-Clearwater's backcountry maintain historical site conditions to provide safe and functioning airstrips for backcountry access."*

Desired condition FW-DC-REC-15 states:

> *"The seven existing public backcountry airstrips provide users the unique opportunities to quickly access vast and remote backcountry and wilderness areas for recreational activities."*

These desired conditions would direct management to maintain recreational use of backcountry airstrips and ensure they are maintained for public safety. The backcountry airstrips are expected to continue to receive recurrent use by the public and by the Forest Service. These actions could displace grizzly bears within areas near the three backcountry airstrips within the Bitterroot Recovery Zone once occupied. It could also displace bears from around the four airstrips outside the recovery zone. These effects would be localized around the airstrips. Once bears move into the recovery zone, they airstrips could increase the probability of human bear conflicts.

Administrative or emergency aircraft uses are infrequent and may result in disturbance but not lasting or recurrent effects. Perhaps the most impactful uses are those authorized through special uses permits to the public or operators who then use them for recurrent uses. These can result in longer lasting and repeated disturbances that can displace grizzly bears from important resources. Outside of these effects, aircraft use is expected to be localized, infrequent, and of little consequences to grizzly bears.

Effects of Rangeland Management and Domestic Livestock Grazing

Grazing of domestic livestock is another factor that can affect grizzly bears, in that grizzly bears are known to occasionally depredate on domestic grazing animals such as cattle or sheep. Such conflicts between grizzly bears and domestic livestock can result in the capture, relocation, injury, or removal of grizzly bears. Grizzlies prey more readily upon sheep than cattle, but cattle may compete with grizzlies for forage in key habitats such as riparian sites. The plan only varies whether the only sheep allotment in the plan area is suitable for sheep grazing and varies to consider effects of exposure of bighorn sheep to pathogens from domestic sheep. This allotment would be evaluated for decisions after site specific analysis.

Livestock allotments only overlaps a little of the Bitterroot Recovery Zone and most allotments are spatially separated from where grizzly bears would most likely disperse through the Forest. The likelihood of grizzly bear depredation would be low until more grizzly bears enter the analysis area and the bear population grows. The Bitterroot Recovery Zone on the Nez Perce-Clearwater is largely ungrazed, save for a very small portion of one cattle allotment that overlaps about 380 acres of the Recovery Zone near the Big Mallard Creek trailhead. That allotment is currently vacated and is not currently grazed though it is not closed and could again be grazed in the future. Most future potential conflicts, if they occurred, would be outside of the Bitterroot Recovery Zone. The current distribution of allotments maintains the ecological conditions to provide for grizzly bear recovery because most areas where grizzly bears would be expected to occur are separated in space from grazing allotments. For reference and distribution of the allotments (figure 42).

Grazing is a suitable use on most of the forest under the proposed action. Any authorization or reauthorization of grazing allotments would require a site-specific analysis and decision before approval. Livestock grazing is suitable in most of the forest under the proposed action. It is conditionally suitable within designated and suitable wild and scenic rivers. Generally, grazing is subject to the wild and scenic river plan and must protect outstandingly remarkable values. Suitability within wilderness areas depends upon the enabling legislation for each wilderness. For the Selway-Bitterroot and Frank Church Wilderness Areas, enabling legislation essentially allows grazing of livestock established prior to the date established and shall be allowed to continue with reasonable regulations. The Wilderness Act and the Central Idaho Wilderness Act does not allow livestock grazing after the dates these wilderness areas were established.

FW-DC-GRZ-01 is a desire to allow range resources to be available for use. Plan direction in the livestock grazing section would potentially have minor environmental consequences for grizzly bear habitat conditions because it could alter vegetation that provides habitat. Desired conditions FW-DC-GRZ-01 outlines the desire for grazing to provide for ecosystem services including on transitory forage created after disturbances. Guidelines in the grazing section would ensure that grazing resources are used sustainably because guideline FW-GDL-GRZ-03 specifies that utilization would be limited to between 35 to 55 percent utilization, which is considered moderate grazing. These plan components would help reduce or minimize impacts to vegetation. The range management section of the plan has no specific plan direction related to grizzly bears. Additionally plan components for grazing found in Livestock Grazing

(Aquatics and Riparian) would help prevent habitat changes from grazing within riparian areas which should help maintain these habitats for grizzly bear use. Comparatively speaking, the plan direction in the 1987 plans for range management are similar to plan direction in the proposed action. In the event, that grizzly bears begin residing within the plan area, measures could be taken to minimize potential conflict.

Food or Attractant Storage

The revised forest plan does not have direction for management of attractants. The plan area also does not have a food storage order in place; however, food storage orders can be implemented with a forest order outside of the Forest Plan. Instead, it has a desired condition to educate the public about bear safety and food storage, and a desired condition to equip campgrounds with food storage infrastructure in FW-DC-WL-07 and FW-DC-WL-08. These plan components state:

- **"FW-DC-WL-07.** The risk of grizzly bear-human conflict is reduced through awareness. The public, Forest Service employees, contractors, volunteers, and permittees are knowledgeable of conflict prevention strategies through education and interpretation.
- **FW-DC-WL-08.** Within occupied grizzly bear habitat, developed recreation sites, administrative sites, and dispersed recreation sites where garbage disposal services are provided, facilities are equipped with necessary infrastructure so that food, garbage, and other attractants can be made inaccessible to grizzly bears to reduce the potential of human-bear conflict."

The potential increase of developed and dispersed recreation sites as outlined below could create conditions where conflicts with humans are more probable. See the section below on developed and dispersed sites. In the event, that grizzly bears begin residing within the plan area, measures could be taken to implement a food storage order though a special forest order in coordination with the Bitterroot Interagency Subcommittee.

The plan's Management Strategy and Approaches outlines agency intent related to grizzly bear conservation. They include FW-MSA-WL-03 which states the following:

- "**FW-MSA-WL-03.** Interagency Grizzly Bear Committee recommendations for sanitation plans, infrastructure and reducing attractants may be implemented within and outside recovery areas to reduce grizzly bear-human conflict."

This Management Approach would suggest that the Forest would implement the Interagency Grizzly Bear Committee recommendations for reducing attractants. For more information see the potential management approaches section below.

Effects of Recreation, Dispersed and Developed Site, Trails and Special Uses

Since adoption of the forest plans, recreation activities across the Nez Perce-Clearwater have changed and will continue to change. This analysis assumes that changes to recreational use patterns would occur naturally as a result of factors associated with recreation trends, advances in technology, aging population, aging infrastructure, local population increase and decreases, and climatic changes. Recreation trends and use patterns would continue to influence the demand for development, amount, and distribution of developed and dispersed recreation across the Nez Perce-Clearwater. Recreational use is expected to increase in the analysis area over time. Demand for developed and dispersed sites may increase as a result of changing demographics of Nez Perce-Clearwater visitors. Currently, developed campground capacity maxes out during summer weekend peak time periods. The existing 55 developed campgrounds would likely continue to be at or near capacity during the busiest weekends. Use of dispersed recreation overnight sites may increase as these developed sites reach or exceed capacity. The effects from the proposed action are expected to be similar to those of the existing condition as this demand is not within in Forest Service control.

The Forest Plan does not authorize any new recreational developments or dispersed sites. Instead, it sets the context under which decisions on future recreation sites and upgrades to existing sites would be developed under the plan. The mechanism to set those contexts in the plan is the Recreation Opportunity Spectrum settings analyzed above. Recall that the recreation opportunity spectrum classes differ in their level of development in addition to whether motorized uses are suitable (table 110). Therefore, it also determines the amount, and types of suitable recreation sites.

Demand for dispersed sites may increase or decrease parallel to the amount of motorized access. As recreation use in general increases, there is likely to be additional demand for dispersed sites. With an increase in motorized access would come an increased number of dispersed sites. These would likely be concentrated along currently open roads and trails, as this use would be less accessible elsewhere in the non-motorized areas. Most of the recreation use on the Nez Perce-Clearwater occurs in primitive dispersed sites rather than developed facilities. Dispersed recreation sites are typically concentrated in the Nez Perce-Clearwater's roaded natural recreation opportunity spectrum settings. There are a total of 1,241 dispersed overnight sites known on the Nez Perce-Clearwater. These features are within the road buffer area, and do not reduce secure core area.

Increasing dispersed and developed sites could cause an increase in the probability of a bear human conflict. These could be mitigated or reduced through measures to educate the public about bear safety as directed in plan component FW-DC-WL-07 for grizzly bears. Ongoing actions that seek to educate the public include education about the use of bear spray, bear education efforts at events in local communities, information distributed at ranger stations, and signs at recreation facilities. Education materials would probably be more available within developed sites than dispersed sites. Human-bear conflicts could also be minimized through proper storage of attractants. While the plan does not have any direction requiring storage of food or attractants, the intent is that the forest would initiate efforts to implement food storage orders in the future through a Forest Order as bears become established.

An increase in formerly primitive settings or semi-primitive non-motorized settings would place more people into proximity with secure habitat that potentially has a higher potential for grizzly bear presence. Roadside dispersed sites are more likely in semi-primitive motorized settings and are less likely to have bear food storage infrastructure which could increase the chance of bear-human conflict. Dispersed sites are often established by users in suitable spots, so the Forest Service has less discretion in how they are established. Until a food storage order is in place, grizzly bears in the plan area might be attracted to these sites and have increased probabilities of bear-human conflicts resulting in grizzly bear removal or death. The plan has no components that restrict construction or improvement of development of developed or dispersed sites. The plan contains a desired condition FW-DC-WL-06 to provide the ecological conditions to allow for colonization of and connectivity to the Bitterroot Recovery Zone. This would direct management to maintain areas important to grizzly bear dispersal to maintain these conditions. FW-DC-WL-06 states:

> "**FW-DC-WL-06:** The grizzly bear Bitterroot Recovery Zone provides the ecological conditions to support recolonization of grizzly bears. Land Management Plan land use allocations provide connectivity to allow secure passage from occupied habitat to the Bitterroot Recovery Zone."

Roads, motorized trails, non-motorized trails, rivers, and airstrips are present on the Nez Perce-Clearwater for visitors to walk, bike, boat, ride, drive, or fly to their destination. There are about 5,300 miles of system trails on the Nez Perce-Clearwater documented in the national infrastructure database, which is the official database for the Forest Service. There are about 1,300 miles of trails located inside designated wilderness areas. These trail numbers include both motorized and non-motorized trails. The use of hiking trails is expected to increase through time as demographics change. The trails system extends throughout the Forest to provide a variety of experiences for the public. Mountain bikes generally can travel any trail on the Nez Perce-Clearwater outside of designated wilderness and recommended wilderness areas and often use a combination of all maintenance level roads and trails to connect desirable areas to ride. In more developed settings, mountain bikers look for roads that access single-track trails in which they can ride mostly downhill. Mountain biking is restricted in designated wilderness and in most alternatives of recommended wilderness. Mountain biking is generally suitable in all other areas. Recreational use of trails in areas where grizzly bears occur would have the potential for bear human conflicts and potentially bear removal or loss as bears become established. There is no specific direction for trail management related to grizzly bears in the plan. No areas would be precluded from new trail construction or reconstruction as a result of the revised forest plan. Plan components provide for increasing connectivity of communities to one another and for increased efficiency of moving people along trails from one location to another.

Motorized trail use is expected to increase as the population grows. Demand for motorized vehicle access and trails is predicted to increase as technology advances. The number of motorized trails is expected to increase some under the plan. New motorized trails would impact or reduce secure habitat. The plan does not authorize, fund, or carry out any new motorized roads or trails. Instead, it sets the conditions under which these features could be authorized in the future. New motorized trail or roads would be authorized or identified during a travel planning project that would require further consultation with the U.S. Fish and Wildlife Service. The plan has few constraints on motorized road or trail building within Management Area 3.

Within Management Area 2, motorized trails would be constrained to be required to leave areas of 5,000 acres or larger without motorized access. This would limit motorized trails to leave secure habitats at least 5000 acres or larger and would limit the total amount of these features allowed within Management Area 2. Furthermore, some areas were identified within Management Area 2 to be in either semi-primitive non-motorized or primitive recreation opportunity settings where motorized trails would not be suitable. New motorized trails would not be suitable within Recommended nor Designated Wilderness Areas and would not be allowed. Motorized suitability was analyzed in the in the Recreation Opportunity Spectrum section above. Motorized trails were included in the delineation of secure habitat. The miles of various trails, including motorized trails, are shown in table 118 and are the existing condition. Summer motorized trails were accounted for in the calculation of secure habitats. Some existing hiking, pack trails and bike trails travel through secure habitats. Grizzly bears can be displaced from areas with human foot or bike travel and may react aggressively if surprised by hikers or biking. The forest service classifies electric bikes as motorized vehicles, and they must remain on motorized trails or roads and are not allowed on non-motorized trails. The proposed action does not authorize any new motorized or foot trails. New trails would require site specific NEPA analysis and Endangered Species Act consultation prior to authorization and must comply with the forest plan.

Table 118. Miles of trail by designed use managed by Nez Perce-Clearwater ranger districts[1]

District	Hiking Trail	Pack Trail[2]	Bike Trail	Winter Non-Motorized Trail[3]	Winter Motorized Trail	Motorcycle Trail	<50-inch Motorized Trail[4]	>50-inch Motorized Trail[5]	Total
Salmon River	1	454	0	6	88	62	111	0	722
Red River	5	590	0	2	316	20	83	0	1016
Moose Creek	1	739	0	0	24	19	4	0	787
Palouse	1	51	15	20	0	16	172	0	275
NorthFork	3	611	0	14	272	0	426	61	1387
Lochsa-Powell	4	766	0	8	114	4	222	2	1120
Total	15	3211	15	50	814	121	1018	63	5307

[1]Designed use is the use for which the trail was designed, although other uses maybe allowed; for example, a trail designed for pack use may also be used by hikers

[2]Pack type trails are designed for pack and saddle users

[3]Non-motorized winter use includes both Nordic skiing and snowshoeing trails

[4]Motorized vehicles less than 50 inches wide. The Forest Service classifies e-bikes as motor vehicles

[5]Motorized vehicles greater than 50 inches wide

The Nez Perce-Clearwater has approximately 212 recreation facilities serving a variety of different recreational opportunities. Most of the recreation facilities on the Nez Perce-Clearwater were developed in the 1960s when highway development expanded access to more of the forest and especially too many of the waterways where facilities are concentrated.

Table 119. Number of recreation facilities by site type[1]

Type	Total Number of Facilities	Of the Total, Facilities that charge Fees	Of the Total, Sites that require a Reservation to Use
Campground (developed)	55	29	6
Camping Area (dispersed)	53	0	0
Group Campground	3	0	1
Visitor Centers	3	0	0
Picnic Day Use Site	12	0	1
Pavilion	3	0	2
Cabin/Lookout	16	11	12
Boat Launch	3	0	0
River Access/Boating Site	5	31	0
Trailheads	40	0	0
Interpretive Sites	12	0	0
Fishing Sites	3	0	0
Snow Park/ Snow Play	4	0	0
Total	212	43	22

[1]Fee at boating site is for floating permit on main Salmon River.

Data Source: INFRA

Recreation special use permits are issued to private businesses, individuals, institutions, and nonprofit groups to provide for occupancy and use of the national forest beyond what is normally available to the public. Permitted recreation uses provide specific recreational opportunities to the public and deliver economic benefits to rural economics. Examples of commercial enterprises requiring permits include outfitting and guiding services, resorts, recreation events, and organizational camps. Noncommercial recreation uses are those where the use or activity does not include an entry or participation fee and the purpose is not primarily the sale of a good or service. Examples of noncommercial use include family reunions, weddings, or other similar group gatherings. The Forest Service issues these permits under the authority of a variety of specific laws. About 60 recreational use permits are issued in any given year across the Nez Perce-Clearwater. Recreation use patterns, and emerging technologies would continue to influence the need for recreation special use permits across the Nez Perce-Clearwater. The plan has no specific direction for issuing these permits in regard to grizzly bears. However, these permits can provide requirements in special use permits without being required in the Forest Plan. Special use permits often include conditions or measures to protect natural resources and the permittees. A number of measures for grizzly bears could be considered and include as a condition of use for both grizzly bears and human safety based on factors such as the permit duration, location, action, and grizzly bear activity in the area among other factors. Conditions or measures could include food storage requirements, timing restrictions, carcass disposal, prohibitions on firearms and other measures.

FW-DC-REC-04 would direct the management of any new or existing infrastructure to be consistent with the desired recreation opportunity spectrum setting. Timber production, timber harvest, permanent road construction, temporary road construction, construction of new buildings or structures, over-snow vehicle use, and mechanized and motorized travel would be suitable in semi-primitive motorized, roaded natural, and rural recreation opportunity spectrum classes.

FW-DC-REC-10 states: "The Forest's trail system provides an array of trail classes for a variety of designed uses. Trail systems connect local communities through the Nez Perce-Clearwater, facilitating long-distance travel, as well as loop opportunities to accommodate short-term, day use activities." This direction would potentially facilitate additional motorized trails and loops, mechanized access, and pedestrian trails potentially where bears may be present or traveling through. Trails, roads, and facilities would be constructed only after site-specific analysis and further consultation with the U. S. Fish and Wildlife Service. These activities would be suitable within about 55 percent of the Forest under the proposed action, including some areas that currently have high amounts of secure habitat. While these activities may be suitable, and are reasonably likely to occur, the exact location, amount and where is unknown at this time. Non-motorized or foot and horse trails would be suitable across the whole forest under the plan. Mechanized trails, such as bicycle trails, are not suitable within designated wilderness nor recommended wilderness and would not be allowed there but are otherwise a suitable use across the rest of the forest. The suitability of motorized trails was analyzed above in the effects of motorized suitability and summer recreation opportunity spectrum section and below in the section titled how the plan addresses motorized access.

Similarly, activities found not suitable would be prohibited, such as roads and motorized trails, and recreation facilities would be managed in a more primitive condition consistent with definitions such as those of the primitive and semi-primitive non-motorized settings and would serve to protect bear habitat. Timber production, permanent road construction, temporary road construction, building permanent structures, over-snow vehicle use, and motorize travel are prohibited within primitive and semi-primitive non-motorized recreation opportunity spectrum classes, all of which would help protect grizzly bears. Semi-primitive non-motorized and primitive settings are found on about 45 percent of the Forest under the Proposed Action. See the Effects of Motorized Suitability and Summer Recreation Opportunity Spectrum section above for more information on effects of Recreation Opportunity Spectrum settings.

FW-DC-REC-05, FW-DC-REC-10, and FW-DC-REC-12 would direct management to facilitate community connections, which might include motorized routes that connect the forest to communities and communities to each other. These may result in a reduction in secure habitat and potentially increase the probability of bear-human conflicts. The Grand Exploration Motorized Trail, or GEM Trail, could increase motorized use on some segments of existing roads or trails.

FW-DC-REC-06 could increase use by increasing outfitter and guide activities that bring people into nature. These activities, depending upon where they occur and the terms of special use permits that authorize those activities, could increase the probability of human-bear conflict as bears move in. FW-DC-REC-14 would help ensure that dispersed sites reduce the risks of social and environmental impacts possibly to grizzly bears.

Some plan components would prevent or address effects to grizzly bears. These are included in the table below.

Table 120. Recreation plan components that may be beneficial or prevent effects to grizzly bears.

Plan component Name	Type of Plan Component	Description of plan component	Effect of the plan component
FW-DC-REC-04	Desired condition	Plan component states "The type and level of infrastructure, visitor services, and information are sustainable and consistent with the desired recreation opportunity spectrum settings."	This desired condition would direct management of recreation infrastructure to be consistent with the pertinent recreation opportunity spectrum setting. Broad areas of the forest would be managed as primitive and semi-primitive non-motorized.
FW-DC-REC-01	Desired Condition	States: "Recreation opportunities are available across a variety of settings that foster quality year-round developed and dispersed experiences, as well as motorized and non-motorized opportunities consistent with the applicable recreation opportunity spectrum (ROS). These settings reflect the integration of other resource values in a sustainable manner with the desired recreation opportunities, facilities, infrastructure, and access provided within those settings. A table of the desired summer recreation opportunity spectrum classes is displayed in table 15 in the Forest Plan and desired winter recreation opportunity spectrum classes in table 16 of the Forest Plan as well as in maps in Appendix 1."	This desired condition would direct the amount of development of recreation sites across broad areas of the forest. Large areas are composed of settings that would be managed for a more remote and rustic recreation experience which would benefit grizzly bears. Other settings may not be as favorable for grizzly bears.
FW-DC-REC-13	Desired condition	States "Dispersed recreation sites are available in desirable locations, are socially and environmentally sustainable, and are consistent with the recreation opportunity spectrum classes and travel management designations."	This desired condition would direct dispersed sites to be consistent with the definitions of the respective summer recreation opportunity spectrum classes. This would serve to maintain many areas in the forest as a primitive or semi-primitive setting which could help maintain some grizzly bear habitats.
FW-STD-REC-01	Standard	States: "Construction, reconstruction, and maintenance of recreation facilities and trails shall be consistent with the recreation opportunity spectrum classes and specialized plans such as wilderness, recreation corridor, river management, scenic byway, and trail management plans as appropriate."	This would require any new or existing facilities to be consistent and appropriate for the respective area and consistent with the definitions of recreation opportunity spectrum classes.
FW-DC-WL-07	Desired Condition	States: "The risk of grizzly bear-human conflict is reduced through awareness. The public, Forest Service employees, contractors, volunteers, and permittees are knowledgeable of conflict prevention strategies through education and interpretation."	This plan component would direct the forest to enhance and increase efforts for educating the public of the possibly of bear-human conflicts, the presence of grizzly bears within the plan area and how to stay safe while recreating. This will in turn help prevent bear deaths.
FW-DC-WL-08	Desired Condition	States: "Within occupied grizzly bear habitat, developed recreation sites, administrative sites, and dispersed recreation sites where garbage disposal services are provided, are equipped with necessary infrastructure so that food, garbage, and other attractants can be made inaccessible to grizzly bears to reduce the potential of human-bear conflict.	This plan component would help address attractants at recreation sites to help prevent attracting grizzly bears to recreation sites and prevent conflicts.

Effects of Minerals and Energy

Inside the Bitterroot Recovery Zone, mineral rights were withdrawn through wilderness designation, save for any mineral rights at the time in accordance with enabling legislation. The Frank Church-River of No Return, Selway Bitterroot, and Gospel Hump Wilderness areas are not available for new leases or claims for locatable minerals, mineral materials, or leasable minerals. These withdrawals largely prevent impacts to the Bitterroot Recovery Zone from mineral and energy related activities.

In other areas of the forest where connectivity is important, mineral activities will be recognized and developed in accordance with existing laws, regulations, and rights of the individuals and companies involved. The laws and regulations largely govern the effects. Plan direction for minerals are within allowed uses under laws and regulations.

There are no plan components that restrict the location of mineral activities except suitability plan components. Mineral activities and their effects on grizzly bears would change very little under the proposed action. The difference in the influence on mineral, geological, and energy resources are primarily through changes in land allocation and suitability of uses. These would alter the considerations made when approving surface occupancy and developments for mining activities. For example, how mineral activities are approved for surface occupancy and reasonable access managed differ in recommended wilderness compared to Idaho Roadless Rule Areas. However, recommended wilderness areas are not withdrawn from mineral entry and are available for new leases or claims if the social and ecological characteristics that provide a basis for wilderness designation are maintained and protected.

The effects to dispersing bears outside of the Bitterroot Recovery Zone is influenced by how the Idaho Roadless Rule allows mineral activities. The Idaho Roadless Rule does not restrict any authorized mineral activity prior to October 16, 2008. Road construction or reconstruction associated with mining activities within Idaho Roadless Rule areas may only be approved after evaluating other access options. Road construction or reconstruction associated with mining activities within Idaho Roadless Rule areas must be conducted in a manner that minimizes effects on surface resources and must be consistent with land management plan components. Roads constructed or reconstructed within Idaho Roadless Rule areas must be decommissioned upon completion of the project or expiration of the lease, permit, or other authorization.

The Idaho Roadless Rule does not affect mining activities conducted pursuant to the General Mining Law of 1872. The Forest Service will not authorize the sale of common variety mineral materials in Idaho Roadless Areas designated as Wild Land Recreation, Special Areas of Historic or Tribal Significance, or other Primitive themes. The Forest Service may authorize the use or sale of common variety mineral materials and associated road construction or reconstruction to access these mineral materials in Idaho Roadless Areas designated as Backcountry Restoration only if the use of these mineral materials are incidental to an activity otherwise permissible. Overall, mineral activities in roadless rule areas or recommended wilderness areas would have little effect on grizzly bear habitats or connectivity.

The Forest Service may authorize the use or sale of common variety mineral materials and associated road construction or reconstruction to access mineral materials designated as General Forest, Rangeland, and Grassland only if the use of these materials are incidental to an activity otherwise permissible. Currently there are no lands in the planning area designated as General Forest, Rangeland or Grassland under the Idaho Roadless Rule.

With proper coordination, minerals related activities may be compatible with grizzly bears and their habitat. The effects to grizzly bears include disturbance and displacement from around mining sites. There may be conflicts with bears during operations. Surface occupancy by mining operations will result in a loss of habitat. Energy and minerals management could affect grizzly bears through reductions in secure habitat due to additional road access, or through additions of developed sites with associated noise and human presence.

Mineral extraction activities are also managed through suitability plan components. Suitability plan components determine where mineral extraction is suitable based on land allocations. Suitability for mineral related activities can be found in tables included in the Forest Plan, including all their footnotes. Activities can be suitable, conditionally suitable, or unsuitable. If an activity is not suitable under the plan in a particular area, the activity would be prohibited within those areas. Similarly, if an activity is conditionally suitable, it can occur only under the circumstances identified in the table footnotes. Suitability for mineral and mining activities addresses some of the threats to grizzly bears because they limit how and where these activities can occur depending upon the area. Areas with restriction include wilderness, designated wild and scenic rivers, and Idaho Roadless Rule Areas for example.

Mineral activities are divided into three types, locatable minerals, leasable minerals and mineral activities or saleable minerals. Mineral related activities and their availability are governed by law. Therefore, suitability must be consistent with the laws. Laws like the wilderness act, the Idaho Roadless Rule, and the Wild and Scenic River Act, as well as enabling legislation for wilderness and wild and scenic rivers have withdrawn or modified how and where mineral activities are managed. Suitability differs for the three types of minerals.

Locatable minerals are suitable in most areas of the forest except wilderness, developed sites and administrative sites. Locatable minerals are conditionally suitable in recommended wilderness and designated wild and scenic rivers. They are conditionally suitable in recommended wilderness to the extent allowed in the Idaho Roadless Rule Areas and designated wild and scenic rivers under specified conditions on valid mining claims (FSM 2354.42d), depending upon the river management plan.

Leasable minerals are not suitable in the Landmark Historic Corridor, Wilderness, and two Idaho Roadless Rule theme areas including the wildland recreation and primitive and Special Areas of Historic or Tribal Significance theme area. They are also not suitable in riparian management zones, mass movement areas, recreation sites, administrative sites, and research natural areas. They are conditionally suitable within designated and suitable wild and scenic rivers when consistent with river management plan and/or when protecting outstandingly remarkable values. They are otherwise suitable.

Mineral materials (saleable) are not suitable within Landmark Historic Corridor, Wilderness, designated wild and scenic rivers in the wild classification, and two Idaho Roadless Rule theme areas including the wildland recreation and primitive and Special Areas of Historic or Tribal Significance theme area. They are also not suitable in riparian management zones, mass movement areas, recreation sites, administrative sites, and research natural areas. They are conditionally suitable within designated and suitable wild and scenic rivers when consistent with river management plan and/or when protecting outstandingly remarkable values. Finally, they are suitable within Idaho Roadless Rule areas to the extent they are allowed in the Idaho Roadless Rule. Otherwise, they are suitable use outside these areas. Thus, vast areas of the forest receive various levels of protection against impacts from mineral extraction under the plan and would help maintain conditions for grizzly bears.

Plan components in the energy and minerals section may have some environmental consequences to grizzly bear habitats if mining or energy extraction activities occur within secure habitat. These activities would create a footprint representing loss of habitat and human presence at these sites could lead to bear-human conflicts. Reasonable access requirements sometimes would reduce secure habitat when roads are constructed. The desired condition in this section is that mineral resources are available for use. The

Forest Service has limited authority to limit these activities. However, the extent of mining or mineral activities would likely be over only a small proportion of grizzly bear habitat so the effects would be minor. FW-STD-EM-01 would require abandoned operations to be returned to a state of site condition comparable to pre-mineral activity and provide comparable form and function based on site potential. This plan direction would help mitigate the loss of habitat after operation are complete. Essentially, management direction in the 1987 forest plans are similar to those in the proposed action.

Land Ownership and Land Uses

Plan direction in the land ownership and land uses section would have both negative and beneficial consequences on grizzly bears. FW-DC-LND-01 specifically would direct land acquisitions to prioritize habitat for at-risk species, which could have beneficial consequences for grizzly bear connectivity and habitat conservation. On the other hand, FS-DC-LND-04 could facilitate minor impacts to grizzly bear habitat from energy developments because it could encourage development of energy infrastructure. However, grizzly bears are expected to recover in designated wilderness where these facilities would not be allowed. The potential for oil or gas extraction is low to very low on the Nez Perce-Clearwater so there would be little chance to have oil and gas extraction projects. Wind energy potential is also low so there is less likely to be wind energy developments. More likely would-be rights of way for the electrical grid or oil and gas pipelines for the transportation of these resources. These types of infrastructure usually have temporary impacts during construction but then would have low impacts after completion. The footprint would be limited to only a very small percent of grizzly bear habitat in the plan area. Plan direction in FW-GDL-LND-01 would require using exiting rights of ways before constructing new ones which would serve to minimize the impacts.

Ecosystem Services

The Forest Service must balance multiple uses with the conservation of wildlife. Desired condition FW-DC-ES-01 emphasizes a variety of human uses including ecosystem services to area residents and visitors. Key benefits emphasized include: clean water; clean air; wood products, including timber and firewood; forage; hunting and fishing; fish; cultural values, including heritage values, subsistence food gathering, and spiritual and inspirational values; scenery; recreation; and flood control and soil stabilization. Management will emphasize these uses as a result of this desired condition for the benefit of people, but there may be some instances when the resulting actions ends up impacting grizzly bears. However, this plan component does not authorize these activities, and all projects would require separate consultation and analysis.

FW-GDL-ES-01 is a guideline to provide for social and economic sustainability of rural communities. It states:

"To provide for social and economic sustainability of rural communities, access to activities such as recreation, hunting, fishing, gathering, egress and wildfire management should continue to be provided for on routes or in areas designated as open to motorized use in the summer and winter. If a route is identified as adversely affecting aquatic ecological values, rerouting and route improvement should be considered prior to closure, to preserve motorized access opportunities. If a route or area needs to be closed, alternate motorized access to maintain social and economic sustainability of rural communities should be provided."

It ensures that routes open for motorized use in the summer and areas in the winter, should continue to provide access for recreation, hunting, fishing, gathering, egress, and wildfire management. This guideline requires that, in the event of a route closure or relocation, alternate motorized access to maintain social and economic sustainability of rural communities should be provided. In many areas of the Nez

Perce-Clearwater, road densities are high or very high locally and may need to be reduced due to resource concerns. In the event that happens, new roads or motorized trails may be required to maintain access. This plan component would also require that any closure of over-snow areas would require consideration to maintain access. This guideline would serve to maintain the baseline travel condition in the plan area, which is consistent with the minimum roads system analysis. The plan component would have a chilling effect on reducing motorized impacts to natural resources through closures. Motorized Routes would be more likely to be moved rather than closed. It could also lead to a redistribution of roads and motorized access when closing areas to motorized access for resource reasons. If the redistribution of motorized access, occurs in areas of currently existing secure habitat, secure habitat could be impacted. Any new motorized access would require a separate analysis and Endangered Species Act consultation prior to a travel management decision. And new motorized access would be required to be consistent with the entirety of the plan, including wildlife components maintain secure habitat and riparian components greatly limiting new roads within RMZs. This plan component works in concert with other plan components, it does not supersede nor loosen requirements of any plan component and a project must meet all standards and guidelines and not preclude attainment of any desired condition to be consistent with the plan.

FW-GDL-ES-01 would apply to all future travel management projects including forest wide travel decisions and travel decisions made in individual projects. Perhaps the most widespread ramification of FW-GDL-ES-01 would be in its application to conducting a Forest wide travel plan, as would occur on the Nez Perce National Forest in the future. In this case FW-GDL-ES-01 would have sweeping influence on travel planning process. It would require careful consideration when closing routes for aquatic resources, and potentially require leaving open or providing alternative motorized access when doing so. The intent of the plan component is that it does not apply to closures needed to achieve the minimum travel system during forest wide travel planning. When closing routes, a responsible official would have to consider leaving routes open, and if a route or area needs to be closed, alternate access to maintain social and economic sustainability of rural communities should be provided. The plan component is not necessarily limited to specific locations or routes per se but could be applied so as to require providing alternative access opportunities or experiences as well. The plan component does not specify whether it would apply to requiring similar maintenance levels, seasons of use, nor whether the alternate access would applied in the same general area or a new area. These decisions would be made by the responsible official during project development and through ESA consultation.

While this plan guideline would not cause an increase in new motorized routes, it would hinder any progress to reducing any adverse baseline conditions existing because of the travel system even during ESA consultation. In combination with motorized suitability decisions, the overall travel system could essentially only trend higher rather than decline as a result of this guideline.

The direction in FW-GDL-ES-01 also applies to winter motorized recreation. If areas previously open to winter motorized recreation were closed, the guideline would require consideration to maintain access or providing alternate winter motorized access in the event areas for winter motorized access are closed. Closure of winter motorized access under in the future is a fairly unlikely event that would potentially occur during the establishment of a travel plan like would occur within the Nez Perce portion of the combined Forest. It would primarily affect potential denning habitat by requiring a maintenance of winter motorized access or the provision of alternate winter motorized access in the event of a closure. This would be essentially a one-time decision made within the scope of the travel plan and it would have a site-specific analysis with associated ESA consultation. Effects of winter motorized access was analyzed in more detail above and the scope of the effects would be consistent with the effects detailed in that section. The guideline does not determine where the new area would be and may be located in areas outside of potential grizzly bear denning habitat.

Language in FW-GDL-ES-01 suggests that in order for the guideline to apply the area would need to have been "provided for on routes or in areas designated as open to motorized use." This language seemingly would not apply to areas in the Nez Perce portion of the planning area that have not yet undergone travel planning and are "open unless designated closed" because they have not yet been designated as open in a travel plan.

These Forest wide Travel Planning outcome would typically only occur once mostly within the Nez Perce National Forest portion of the planning area, though it could also apply to any forestwide modifications of the Clearwater Travel Plan. Thereafter the travel system could be modified through decisions on individual travel routes and this guideline would also occur. Aside from Forest wide travel planning, FW-GDL-ES-01 would also apply to decisions regarding the travel system on individual routes or modifications of the travel plan. For example, road or trail system decisions are often made concurrent to support timber operations or individual projects can authorize new road or trails for recreational purpose. Likewise, individual travel decisions can also close individual routes. In these cases FW-GLD-ES-01 would require consideration of or provision of alternative routes.

Motorized route closures would be more likely to occur where there are already more motorized routes such as within Management Area 3, though this plan component is a forest wide plan component and could occur within Management Area 2 as well. It is unlikely to apply to areas not suitable for motorized uses like in most areas of Management Area 1. The applicability of this plan component is more limited outside of Management Area 3 as described below.

This plan component would not result in new motorized roads nor trails within areas not suitable for motorized uses. These include wilderness areas, recommended wilderness areas, research natural areas, wild classification of suitable and designated wild and scenic rivers, and Idaho Roadless Rule Areas not suitable for motorized uses. The application of FW-GDL-ES-01 would be limited or not applicable to most area of Management Area 1 the vast majority of which is not suitable for motorized uses. Because motorized roads and trails would not be a suitable use in these areas, motorized access would not be allowed within these areas. Therefore, these areas would not have relocations of motorized routes resulting from FW-GDL-ES-01.

Within Idaho Roadless Rule areas that are suitable for motorized uses, which under the proposed action is mostly within the Backcountry Restoration Theme, road reconstruction or relocations are prohibited unless the Regional Forester determines that:

> *"Road is needed for public health and safety for imminent threat of loss of life or property; or in Response to CERCLA, Clean Water Act or Oil Pollution, or Statute, treaty, reserved or outstanding rights or other legal duty of the United States; or Road realignment to prevent irreparable resource damage that can't be mitigate by normal road maintenance for roads essential for public or private access, natural resource management, or public health or safety; or Road reconstruction for road safety on a road determined to be hazardous; or Secretary of Agriculture determines a Federal Aid Highway (Title 23 of the U.S. Code) is warranted."*

Some situations might arise where the Regional Forester makes the determination that roads need to be reconstructed or relocated because of natural resource reasons. Therefore, FW-GDL-ES-01 could apply when system routes are closed for the specific reasons outlined in the Idaho Roadless Rule. Other Idaho Roadless Rule Area Themes do not allow these exceptions and so FW-GDL-ES-01 would not apply there. Furthermore, since they are not suitable for motorized uses, they would not be subject to new motorized routes. However, new access routes in other locations suitable for motorized uses could be established as a result of FW-GDL-ES-01.

The Idaho Roadless Rule areas suitable for motorized uses would allow relocation or reconstruction of motorized trails. Therefore FW-GDL-ES-01 could be applicable to motorized trails within Idaho Roadless Rule Areas suitable for motorized uses. Any motorized trail that would need to be closed for resource reasons could be relocated within MA2, provided the trail is consistent with all other forest plan direction.

FW-GDL-ES-01 specifically identifies that when closing for aquatic resources, rerouting and route improvement should be considered. If routes are closed for aquatic resource reasons, it is reasonable to assume that in most of these cases the routes would be moved into upland areas. In these situations, the species-specific grizzly bear plan component MA2-GDL-WL-05 would not constrain this activity because it specifically states that the guideline does not apply to existing trails that are relocated or reconstructed to mitigate negative impacts to ecological resources. If the relocated trail resulted in a block of secure habitat smaller than 5,000, guideline MA2-GDL-WL-05 would then not apply to that block of secure habitat in future projects because it does not protect blocks of secure habitat smaller than 5,000. Therefore FW-GDL-ES-01 interacting with MA2-GDL-WL-05 could cause an inadvertent loss and fragmentation of secure habitat for grizzly bears. However, the project would need to be consistent with other plan components including MA2-DC-WLMU-02 which is a desired condition that states that: “Areas at least 5,000 acres in size exist without motorized access open to the public to maintain habitat use by elk.” Therefore, the desired condition would provide some guidance in the placement of such a trail relocation.

The relocation of motorized routes within Management Area 2 is probably going to be a relatively rare occurrence because there are fewer motorized roads and trails present in Management Area 2 and most of them are located on uplands like ridgelines with a few notable exceptions. A motorized trails runs approximately 27 miles along Weitas Creek, and a road runs along nearly the entirety of the North Fork of the Clearwater which are critical habitat for bull trout. These motorized features are not likely to be relocated.

Management Areas 3 has the highest likelihood of motorized route closures or relocations, simply because it has the most motorized routes, many of which are near important aquatic resources. Management Area 3 has few secure habitats, and most of them are small and scattered. Thus, they have little conservation value to supporting resident grizzly bear populations, however, dispersing grizzly bears may use them and they may provide important refuges. The distribution of effects resulting from compliance with FW-GDL-ES-01, specifically in providing alternate motorized access in the event of a closure, would be diffuse across the plan area and Management Area 3. After travel planning is completed, it would be irregular in its timing, arising only when needed, but would occur throughout the life of the plan.

The plan component should not be expected to increase the probability of attractants or increase the probability of conflicts because it seeks to only maintain access so it would not generally result in an increase and would mostly redistribute motorized access. However, it may hinder addressing grizzly bear related conflict or mortality issues related to the distribution and abundance of motorized access because it would require that “alternate motorized access to maintain social and economic sustainability of rural communities should be provided.”

How the Plan Addresses Motorized Access

The plan must be viewed holistically in order to understand how the parts of the plan work together to address motorized access. The plan layers land use allocations, management area direction, suitability of uses, desired conditions, standards and guidelines which all contribute to managed motorized access to conserve secure habitats. This section provides an overview of how all the parts work together to address motorized access in relation to grizzly bears.

Motorized access is both a habitat related threat and a source of human caused mortality (U.S. Department of the Interior 2021c). The current scope of this threat is the area within 0.31 miles from any road or motorized trail open to the public or closed to the public but open to administrative uses by the Forest Service, which is approximately 37 percent of the total plan area currently. Large areas in the plan are precluded or have substantial restrictions in law, regulation, or policy. Consistent with these, suitability plan components also address motorized access through suitability of uses. Everywhere in the plan area is identified as either suitable, conditionally suitable, or unsuitable for a variety of activities related to motorized access. These include permanent road construction, temporary road construction, motorized over-snow travel or motorized travel/motorized recreation. Designated areas that prohibit or regulate motorized uses include Designated Wilderness, Idaho Roadless Rule Areas, the National Historic Landmark, and Designated Wild and Scenic River corridors particularly in the wild classification.

The Bitterroot Recovery Zone is highly protected against motorized access because it occurs in designated wilderness and the Wilderness Act prohibits this activity, with only narrow exceptions that are rarely used. Recall only part of the Bitterroot Recovery Zone occurs within the Nez Perce-Clearwater National Forest as it extends across multiple National Forests. Additionally, the vast majority of the Bitterroot Recovery Zone outside of the Nez Perce-Clearwater National Forest is also designated wilderness areas and would be similarly protected from motorized access. Furthermore, the wilderness areas within the plan are identified as unsuitable for all of the motorized use categories. In addition, the plan area also has the gospel hump wilderness area, which also restricts motorized uses. There are no plans now or in the foreseeable future to have any new motorized roads, nor motorized trails within the Bitterroot Recovery Zone. There is no anticipated future need to have motorized access within the Bitterroot Recovery Zone. The Wilderness Act ensures that this threat will not affect the vast majority of Bitterroot Recovery Zone. Suitability components ensure that there will be none of these activities under the plan in designated wilderness areas.

Outside of Wilderness, the Idaho Roadless Rule areas address this threat in part because it generally prohibits new road construction except in narrow and limited circumstances. These areas make up 1,481,565 acres of which 1,111,642 acres are secure habitat. Management area 2 is made up of Idaho Roadless Rule Areas, Eligible and Suitable Wild and Scenic Rivers, Recommended Wilderness, and research natural areas. Each of these constrain roads and motorized access to various extents. They combine to protect for 1,467,078 acres of which 1,124,882 or 76.6 percent is secure habitat currently. The Roadless Rule Area boundaries are often delineated by roads which existed prior to their establishment. So naturally there would be some lack of secure habitats from preexisting roads.

Allen (2011) described secure habitat conditions in the Selkirk and Cabinet Yaak ecosystems based on data from Wakkinen and Kasworm (1997). For context, the entire Selkirk Ecosystem is 1,307,525 acres of which only 688,642 acres occurs within the United States, and of which only 298,176 acres of habitat was secure core. The Cabinet Yak ecosystem is 1,693,248 acres of which 628,543 was secure core. The two ecosystems combined to support secure habitat of approximately 926,719 acres in 1997 (Allen 2011). By comparison, the Idaho Roadless Rule areas within the Nez Perce-Clearwater alone is 1,481,636 acres, not including the wilderness areas, and are larger than the entire Selkirk Ecosystem. The amount of secure habitat within Management Area 2, which is a total of 1,124,882 acres are larger than the total amount of secure habitats in these two ecosystems combined (926,719 acres). The combined effects of Management Area 1 and 2 direction is that 2,698,716 acres that are either fully protected or partially protected by either the highly restrictive plan direction for Management Area 1 lands or the constraining direction of Management Area 2. These lands have 2,268,274 acres of secure habitat currently. These are in a landscape where roads are either not suitable in the plan, not allowed by law or allowed with only limited exceptions. Some Idaho Roadless Rule Areas are suitable for motorized uses, and some are not. There are a total of 1,681,779 acres of secure habitat completely protected as either designated wilderness or Idaho

Roadless Rule areas where motorized uses are not suitable. Of the Idaho Roadless Rule Areas, approximately 565,519 acres of secure habitat in Idaho Roadless Rule Areas that are suitable for motorized uses under the Recreation Opportunity Spectrum settings. These areas are protected against new road development by the Idaho Roadless Rule, and new motorized trails are constrained in these areas by MA2-GDL-WL-05. MA2-GDL-WL-05 both allows some limited impacts to 24% of the secure habitats in the plan area, while also placing a limit on the amount of secure habitat that motorized trails could impact. A total of 542,720 acres of secure habitats in Idaho Roadless Rule Areas are not suitable for motorized uses within Idaho Roadless Rule Areas.

These areas may contribute to grizzly bear connectivity by constraining construction of new roads and other actions related to motorized uses that may affect grizzly bear secure habitats. The Idaho Roadless Rule does not prohibit motorized trails, but motorized trails are constrained by plan components MA2-GLD-WL-05 and were discussed in detail above.

Suitability plan components are plan components that identify where uses are suitable, conditionally suitable, or unsuitable. These broad-brush plan components are based on land management allocations and allow or disallow a variety of uses. If uses are not suitable, future projects for these uses would not be allowed under the plan in those areas. Suitability plan components in the plan that address motorized access. While these tables are somewhat redundant in their information, there are often nuances that are distinct between tables. The two tables that displayed the most comprehensive overview of motorized access suitability in the plan. An additional table from the revised forest plan is the Recreation Opportunity Spectrum directly addresses motorized use suitability for all lands in the Forest.

Suitability plan components constrain 3 actions or activities related to motorized access including motorized recreation or travel, permanent road construction, motorized over snow travel and temporary road construction. These activities are restricted within designated wilderness, designated wild and scenic rivers within the wild classification, the National Historic Landmark, recommended wilderness areas, Idaho roadless rule areas, suitable wild and scenic river areas, Research Natural Areas, and primitive and semi-primitive non-motorized Summer Recreation Opportunity Spectrum settings. The entirety of where motorized and non-motorized uses are suitable or not are cumulatively incorporated into the Summer and winter Recreation Opportunity Spectrum (Effects of Motorized Suitability and Summer Recreation Opportunity Spectrum). Note that in many cases, footnotes in these tables tier to the Wilderness Act, The Idaho Roadless Rule, and other by designating legislation.

Table 121 describes the content of each suitability plan component and identifies how motorized use are specifically addressed.

Table 121 The content of suitability plan components in tables within the revised forest plan under the proposed action.

Suitability Plan Component Tables in the Revised Plan	How Motorized access is addressed by the Suitability Plan Components
Table 18 – Suitability plan component in Sustainable Recreation	Identifies the activities suitable or not suitable within the Recreation Opportunity Spectrum settings. Permanent road construction, temporary road construction, and motorized travel is unsuitable in Primitive and Semi-primitive Non-motorized settings. Some Recreation Opportunity Spectrum settings were identified as not suitable for motorized uses specifically for grizzly bears.
Table 17- Suitability in Developed Recreation Sites Table 20--Suitability in Administrative Sites Table 26--Suitability in designated wilderness	The suitability of uses across all land management allocations in the Forest Plan are contained within land allocation specific tables: Table 17, 20, 26, 28, 30, 32, 33, 35 and 37. Construction of Permanent Roads:

Suitability Plan Component Tables in the Revised Plan	How Motorized access is addressed by the Suitability Plan Components
Table 28--Suitability in designated Wild and Scenic River corridors Table 30-- Suitability in recommended wilderness Table 32--Suitability in eligible and suitable Wild and Scenic River corridors Table 33--Suitability in Idaho Roadless Rule Areas. Table 35--Suitability in Research Natural Areas Table 37--Suitability in the Lolo Trail National Historic Landmark	Indicates that permanent road construction is unsuitable without conditions in Designated Wilderness; Recommended wilderness; Designated Wild and Scenic River -Wild classification; Eligible and Suitable Wild and Scenic River-Wild Classification; Idaho Roadless Rule Areas- Wildland Recreation, Primitive and Special Area Themes; Mass movement areas; and Research Natural Areas. They are conditionally unsuitable in Idaho Roadless Rule Areas with a backcountry restoration theme and in Riparian Management Zones except perpendicular stream crossings. Permanent road construction is conditionally suitable in Designated Wild and Scenic River corridors and in eligible and suitable Wild and Scenic River within Scenic and Recreational classifications as long as it is consistent with the river plan and provided ORV's are protected. They are conditionally suitable within Idaho Roadless Rule Areas within Backcountry Restoration Community Protection Zones in accordance with the Idaho Roadless Rule and in the Lolo Trail National Historic Landmark if the purpose is to benefit the National Register integrity. <u>Construction of Temporary Roads:</u> Not suitable in Lolo Trail National Historic Landmark Corridor, Designated Wilderness, Designated Wild and Scenic River's Wild classification, Suitable Wild and Scenic Rivers Wild Classifications, Recommended Wilderness, Idaho Roadless Rule Wildland Recreation Theme and Primitive and Special areas of Historic or Tribal Significance, Mass Movement Areas, and Research Natural Areas. They are conditionally unsuitable in Idaho Roadless Rule Back Country Restoration Themes as permitted by the Idaho Roadless Rule, and Riparian Management Zones prohibited except when they cross perpendicularly to the waterway. Temporary Roads are suitable with conditions in Idaho Roadless Rule Backcountry Restoration Community Protection Zones, Designated Wild and Scenic Rivers within Scenic and Recreation classifications consistent with wild and scenic river management plans, and suitable wild and scenic rivers within scenic and recreation classifications when Outstandingly Remarkable Values are protected. <u>Motorized Recreation:</u> Not suitable in Wilderness nor Recommended Wilderness, Primitive and Semi-primitive non-motorized Recreation Opportunity Spectrum settings, and within designated and proposed Research Natural Areas. Motorized recreation is conditionally suitable within Designated Wild and Scenic River wild classification depending on the Wild and Scenic River Plan and is limited to only motorized uses and unobtrusive trail bridges if ORVs are protected.
Table 26 In the Revised Forest Plan- Suitability plan components in the Forest Plan for Management Actions Suitable within Designated Wilderness.	Indicates that roads, temporary roads, motorized trave, mechanized travel, and motorized over-snow travel is not suitable in designated wilderness areas.

Suitability Plan Component Tables in the Revised Plan	How Motorized access is addressed by the Suitability Plan Components
Table 28 in the Revised Forest Plan- Suitability plan component for management actions in designated wild and scenic rivers.	Indicates permanent and temporary road construction is not suitable within wild classification, but in other classifications they are suitable so long as outstandingly remarkable values are protected. Reconstruction of roads are not suitable within wild classification, but suitable if outstandingly remarkable values are protected. Motorized travel is not suitable in wild classification but is suitable in other classifications as long as outstandingly remarkable values are protected.
Table 30 in the Revised Forest Plan- Suitability plan component in the Revised Forest Plan for Management Actions Suitable within Recommended Wilderness Areas.	Indicates permanent road construction is not suitable, Temporary road construction is conditionally suitable consistent with the Idaho Roadless Rule. Over-snow vehicle use is not suitable, recreational aircraft landings are unsuitable but landings for administrative uses are suitable, and motorized travel is unsuitable,
Table 32- Suitability plan components in the Revised Forest Plan that apply to Eligible and Suitable Wild and Scenic River corridors.	Indicates permanent and temporary road construction is not suitable within wild classification, but in other classifications they are suitable so long as outstandingly remarkable values are protected. Reconstruction of roads are not suitable within wild classification, but suitable if outstandingly remarkable values are protected. Motorized travel is not suitable in wild classification but is suitable in other classifications as long as outstandingly remarkable values are protected.
Table 33 in the Revised Forest Plan showing the- Suitability of Uses within Idaho Roadless Rule Areas.	Indicates that permanent and temporary road construction is not suitable in Wildland Recreation Theme, Primitive and Special Areas of Historic or Tribal Significance theme, and Backcountry Restoration theme areas. Permanent road construction is conditionally suitable in Backcountry Restoration Community Protection Zone areas. Road construction and reconstruction may be allowed only to the extent permitted in the Idaho Roadless Rule (36 CFR 294.23). Motorized travel is suitable as mapped on desired recreation opportunity spectrum maps in the appendix, if mapped as rural, roaded natural, or semi-primitive motorized, motorized use is suitable; if mapped as semi-primitive non-motorized or primitive, motorized use is not suitable. Over-snow vehicle use is a suitable use.
Table 35 in the Forest Plan – Suitability of uses within designated and proposed Research Natural Areas	Motorized travel, permanent road construction and temporary road construction is not suitable within Research Natural Areas. Over-snow vehicle use is suitable in Research Natural Areas.
Table 37 in the Revised Forest Plan-Suitability plan components on lands within the National Historic Landmark	Permanent and temporary road construction is suitable only if the integrity of the National Historic Landmark is maintained, Guideline GA-GDL-NHL-05 further clarifies "New temporary or permanent road and trail construction should not be permitted within the Landmark unless the integrity of the National Historic Landmark is maintained and the purpose of the action is to benefit the National Register integrity of the Landmark."
Table 24 in the Revised Forest Plan – Timber Production Suitability Classification	Identifies which lands or management areas are suitable or not suitable for timber production, timber

Suitability Plan Component Tables in the Revised Plan	How Motorized access is addressed by the Suitability Plan Components
	harvest, and harvest suitable for other resource objectives.

Motorized access is further addressed by plan desired conditions, guidelines, and standards. Plan direction that addresses motorized access includes those within the Aquatic Ecosystem Plan components, multiple uses wildlife plan components, and recreation plan components. The following plan components further address motorized access as described in the table below.

Table 122. How the plan component contributes to the threat of motorized access

Plan Component Name	Type of Plan component	How the plan component contributes to the threat of motorized access
FW-OBJ-WTR-02	Objective	Seeks to enhance or restore 50-100 miles of stream habitat every 5 years. Specifically mentions streamside road decommissioning as an included activity.
FW-OBJ-WTR-05	Objective	Improve soil and watershed conditions every 5 years in priority watersheds and Conservation Watershed Network watersheds. Specifically mentions non-system road decommissioning.
FW-OBJ-RMZ-01	Objective	Objective to improve 300-700 acres of riparian habitats every five years. Specifically mentions road obliteration and removal of road prisms as part of this restoration.
FW-GDL-RMZ-02	Guideline	Guideline that restricts new road and trail construction, including temporary roads, within riparian management zones except under three conditions: a) necessary for stream crossings, or b) a road or trail relocation contributes to attainment of aquatic and riparian desired conditions, or c) Forest Service authorities are limited by law or regulation (e.g., General Mining Act of 1872). Also specifies that temporary roads should be managed to protect aquatic and riparian desired conditions.
FW-STD-ARINF-07	Standard	In the Conservation Watershed Network and HUC12 subwatersheds with Endangered Species Act critical habitat or listed aquatic species, when constructing or reconstructing roads, projects shall result in a net decrease in the hydrologic connectivity of the road system and stream channel network unless no further decreases are needed to meet desired conditions for Water and Aquatic Resources or Conservation Watershed Network. Treatment priority shall be given to roads or road segments that pose the greatest relative ecological risk to riparian and aquatic ecosystems. The net decrease is measured by project area.
FW-DC-ARINF-01	Desired Condition	States: “The transportation system has minimal impacts on aquatic and riparian conditions through reduced hydrologic connectivity of roads to streams, lower sediment delivery to streams, reduced road impact to floodplains, and improved aquatic organism passage, where transportation infrastructure affects these features.” This plan component would direct management to reduce impacts from the transportation system to areas aquatic and riparian conditions. In some cases, it would prevent construction of roads in riparian areas. It may encourage moving existing roads outside of riparian areas.
FW-STD-ARINF-01	Standard	States “Road maintenance and new road construction shall be designed to minimize adverse effects to threatened, endangered, proposed, or candidate aquatic species and their habitat.” This standard would have a chilling effect on roads from being constructed within riparian areas. It would address the manner in which these activities occurred to prevent impacts.
FW-GDL-ARINF-04	Guideline	States: “To reduce road-related mass wasting and sediment delivery to watercourses, new and relocated roads, including skid trails and temporary roads, and other linear features should not be constructed on lands with high mass wasting potential.” This guideline will restrict roads in some areas of the forest even when suitable for motorized uses. Lands with mass wasting potential would remain free of roads.

Plan Component Name	Type of Plan component	How the plan component contributes to the threat of motorized access
FW-GDL-ARINF-08	Guideline	This plan component states: “To avoid adverse effects to water resources, wetlands and seasonally wet meadows should be avoided when constructing new roads and landings, including temporary roads. For all roads, and where reconstruction of existing roads cannot avoid water courses and wetlands drainage features should maintain wetland functions and characteristics.” This guideline would constrain road construction in aquatic, wetlands, and wet meadow habitats.
FW- GDL-AREM -02	Guideline	Specifies that mineral operations should reuse existing access routes and processing sites from previous entries as long as they are not causing unacceptable impacts to aquatic and riparian dependent resources. Also specifies that when no longer required for mineral activities, roads should be decommissioned.
FW-GL-WL-02	Goal	States: “The Nez Perce-Clearwater cooperates with highway managers, state agencies, tribes, and landowners to implement wildlife and aquatic organism crossings that reduce encounters and contribute to public safety.” This goal would encourage management to address road crossings for wildlife which would also help reduce potential vehicle strikes and enhance connectivity.
FW-DC-WL-**06**	Desired Condition	States “The grizzly bear Bitterroot Recovery Zone provides the ecological conditions to support recolonization of grizzly bears. Land Management Plan land use allocations provide connectivity to allow secure passage from occupied habitat to the Bitterroot Recovery Zone” This desired condition would direct management to maintain or restore ecological condition to maintain connectivity which might include considerations when constructing or authorizing motorized roads or trails. Although a project does not have to achieve all desired conditions, all projects must be consistent with plan components and cannot preclude achievement of a desired condition.
FW-GDL-WLMU-01	Guideline	States: “When closing routes to motorized use, to ensure benefits to wildlife habitat are realized, include measures to sufficiently exclude motorized use on closed routes..” Guideline intended to ensure that road closures effectively close and prevent unauthorized use by the public. This plan component would minimize the amount of use closed roads or trails would receive. It only requires the deciding official to consider taking actions but does not require actions. All use of these features would not be legal.
FW-DC-WLMU-07	Desired Condition	States: “Elk habitat is distributed throughout the planning area to support elk populations. Motorized access does not preclude use of high-quality nutritional resources or winter ranges.” A desired condition that would guide management to locate motorized access away from high or moderate quality nutrition for elk, and away from winter ranges. This would also indirectly benefit grizzly bears nutritionally by preventing impacts from roads to these important areas. Grizzly bears will find nutritional resources and more elk away from motorized access because of this desired condition.
MA2-DC-WLMU-02	Desired Condition	Desired condition specific to management area 2 that states: “Areas at least 5,000 acres in size exist without motorized access open to the public to maintain habitat use by elk.” This desired condition would direct management to maintain large areas without motorized uses. While the plan component focuses on elk, it would also have benefits to grizzly bears because it would maintain non-motorized areas within Management area 2.

Plan Component Name	Type of Plan component	How the plan component contributes to the threat of motorized access
MA2-GDL-WL-05	Guideline	Plan guideline that states “MA2-GDL-WL-05. To maintain large areas of unfragmented habitat for wide-ranging species, such as elk and grizzly bear, new motorized trails open to the public should not be authorized in Idaho Roadless Areas unless there are adjacent areas of 5000 acres without open motorized system routes. This guideline does not apply to: Community Protection Zones (CPZs) as defined by the Idaho Roadless Rule. Areas with existing motorized access that are currently less than 5,000 acres. Existing trails that are relocated or reconstructed to mitigate negative impacts to ecological resources. This plan guideline acts as a constraint on motorized trails within Idaho Roadless Rule Areas which make up the majority of Management Area 2. It does not constrain motorized routes in other areas of Management Area 2 that are not Idaho Roadless Rule Areas. It would allow some new motorized trails in Idaho Roadless Rule Areas suitable for motorized uses, but these trails would be limited to areas larger than about 10,000 acres and would maintain secure habitats areas in blocks no smaller than 5000 acres or larger without motorized access in management area 2. It would not apply to secure habitats smaller than 5000 acres so motorized trails could be constructed without restraint there. It also would not apply to lands outside of Idaho Roadless Rule Areas.
MA3-GDL-WLMU-01	Guideline	States: “Treatments designed to improve elk habitat should focus on one or more of the habitat covariates likely to improve predicted cow elk body fat condition. This plan guideline integrates factors that affect predicted cow elk body fat as a restriction, which could include open motorized routes and nutrition. The four factors that affect predicted elk body fat include the abundance of high quality nutritional resources within a given area such as a watershed, whether those nutritional resources are usable by elk based on whether they occur more than ½ mile from a road, the slope that those resources are located on, and the distribution of those nutritional resources in relation to forage cover edges. The specific factors and how they will be applied are outlined in Management Approaches for elk. This plan component would only apply to projects that aim to improve elk habitats in Management Area 3.
FW-DC-REC-12	Desired condition	Desired condition that states: “Trails (e.g., trails converted from roads, user created trails) not needed to serve management or public needs and purposes are absent.” This would direct management to eliminate any unneeded trails including on old roads and user created trails.
FW-STD-REC-01	Standard	Standard that enforces Recreation Opportunity Spectrum Settings as follows: “Construction and reconstruction of recreation facilities and trails shall be compatible with the appropriate recreation opportunity spectrum class and other applicable resource management plans, such as wilderness, recreation corridor, river management, scenic byway, or trail plans.” This plan standard would help ensure that trails, including motorized trails, would be managed compatible with Recreation Opportunity settings.

In summary, the plan has significant measures to prevent or address the threat of motorized access within the plan area. They are hierarchal and start with law, regulation, and policy; are reinforced by suitability plan components and summer Recreation Opportunity Spectrum settings; and then are addressed further by desired conditions, standards, and guidelines. There are rigorous measures to restrict the construction of permanent roads, temporary roads, and motorized travel in a substantial portion of the forest. Measures for roads in riparian areas as noted in the table above (e.g., FW-DC-ARINF-01, FW-GDL-RMZ-02) represent a substantial addition because they occur across all management areas and make up approximately 548,284 acres or about 14 percent of the plan area. This includes 233,201 acres of riparian habitats in land allocations otherwise suitable for motorized uses. About 332,862 acres of riparian habitat are secure habitat.

While these measures address motorized access in many areas of the forest, motorized access is generally not restricted within Management Area 3, and some motorized trails might be constructed in areas suitable for motorized uses in Management Area 2 provided they comply with applicable plan direction. These are activities that could have consequences to grizzly bears because they would result in loss of secure habitat, potential human-bear conflicts and could result in grizzly bear death. These were analyzed in detail in the Effects of Motorized Suitability and Summer Recreation Opportunity Spectrum section above.

Plan Direction that Contributes to Grizzly Bear Recovery

Up to this point this document evaluates potential for adverse effect of the forest plan but many aspects of the plan and plan area will maintain or enhance habitat for grizzly bears. This section describes how the plan provides or maintains habitat for grizzly bears to contribute to recovery.

As outlined above, the overarching conditions that provide for grizzly bear recovery is the fact that the Nez Perce Clearwater is an immense area of land, with approximately 68.5 percent of the landscape as designated areas with substantial laws, regulations, and policy that requires restrictive to highly restrictive management. They include congressionally designated wilderness, Idaho Roadless Rule Area, a National Historic Landmark, and congressionally designated Wild and Scenic River Corridors. Designated wilderness and designated Wild and Scenic Rivers could only be changed by the United States congress and presidential signature.

Changes to the Idaho Roadless Rule would require a cooperative effort between Federal and State governments via rule making and would need to conform to the 2001 Roadless Rule. Consider that the Nez Perce Clearwater is 3,939,056 acres with 2,463,080 acres total secure habitat of which approximately 2,698,716 acres that occur within lands that restrict motorized uses to some extent (Management Area 1 and 2), and which result in protections for grizzly bears. These areas partially or completely protect a total of 2,268,274 acres of secure habitat. Motorized uses are not suitable on 1,778,172 acres, protecting 1,695,498 acres of secure habitat through non-motorized Summer Recreation Opportunity Spectrum settings. For comparison, Yellowstone National Park is only 2,221,766 acres. The three management areas framework of the plan was delineated from the arrangement of designated and restricted lands.

The plan must conform to all laws, regulations, and policy that govern land uses including the Wilderness Act, the Wild and Scenic River Act, the Idaho Roadless Rule, the Endangered Species Act. The plan cannot and will not change any direction contained therein. Instead, it provides additional, or more specific direction as to how these lands would be managed both to conform to the laws and provide a vision for the future of the forest. Thus, the overarching regulations that contribute to grizzly bear recovery are Laws, Regulations, and Policies above and beyond the forest plan and which apply even when they are not stated in the plan. Direction in law, regulation and policy are outlined above in the "existing conditions on the ground" section specifically. It is Forest Service policy that forest plans should not restate what is already required by law, regulation, or policy. It should be assumed that the Forest Service will comply with all laws, regulations, and policies pertaining to the management of these lands. Wilderness, Roadless Rule Areas, and other lands with regulatory requirements combine to provide a vast landscape where grizzly bears can disperse and establish populations for recovery.

Wilderness is the largest contributor to recovery because it contributes the most to the Bitterroot Recovery Zone. Consider that the largest single block of secure habitat is 1,102,583 acres, almost half the size of Yellowstone National Park, and is centered over the Frank Church and Selway-Bitterroot Wilderness Areas which is almost entirely coincident with the Bitterroot Recovery Zone. Approximately 933,361 of the acres are within designated wilderness areas. These are areas where road building, motorized, trails, timber harvest, facilities, recreational development, and other activities are prohibited by the wilderness act with few exceptions The plan reinforces these restrictions. The suitability plan components reinforce those laws by finding those activities unsuitable in designated wilderness. Where activities are allowed, by policy they must still be managed to maintain wilderness character as described above in the existing condition section. Plan direction further refines how these lands are to be managed. As an example, see the suitability plan components in the Designated Wilderness Section of the plan included in the appendix of the BA below.

Uses that are not found suitable in the plan components above are not allowed. Suitability plan components allow the following activities: Livestock grazing, and prescribed fire are suitable uses. These activities would be required to follow Standard MA1-STD-WILD-01 when authorized. This standard requires that "Management activities within designated wilderness areas shall preserve and protect wilderness character as required by the Wilderness Act, as well as each wilderness area's enabling legislation and its specific management plan." This would apply to any other activities not prohibited by the suitability plan components. Furthermore, enabling legislation for wilderness areas restricts new grazing authorizations.

The plan area contains 1,483,636 acres of roadless rule areas (more than half the size of Yellowstone National Park) that surrounds the Bitterroot Recovery Zone and many areas where bears are most likely to travel when dispersing from the North. While the Idaho Roadless Rule is less restrictive than wilderness, it still must be managed for its roadless character, and is highly regulated by rules established in the Federal Register that prohibit a variety of activities. One of the dominant factors that affects grizzly bear survival identified in scientific literature is the effects of roads and human access. The Idaho Roadless Rule prohibits road construction or reconstruction, and applies constraints to vegetation management, and mineral uses. The forest plan further defines suitable uses within these areas and road construction is not suitable on these lands.

The plan components contain provisions for connectivity. See terrestrial ecosystem and wildlife plan components section. The plan does not propose any connectivity areas because the Nez Perce-Clearwater is already a contiguous block of land containing many acres of lands well preserved by management area direction, laws and rules that provide connectivity.

As the planning rule directs, the plan provides coarse filter ecosystem plan components to contribute to species recovery, focused on providing composition, structure, function, and connectivity with the intent to achieve ecological integrity. The plan direction and specific plan components that contribute to ecological conditions for grizzly bears are discussed in the following section.

Plan components that contribute to ecological conditions for grizzly bears

Terrestrial Ecosystem

Threats Addressed

- Vegetation Management
- Climate change

Plan Component

- FW-DC-TE-04
- FW-DC-TE-05
- FW-GL-TE-02

Plan Component Summary

Provides vegetation conditions that reflect natural disturbances and that the composition, structure, function, and connectivity of native plant communities are appropriate for a given landscape and climatic setting. Includes a goal FW-GL-TE-02 to help meet other agencies goals like federally listed species recovery.

Effect

These should contribute to ecological conditions that should promote diversity of plant and animal communities that should help provide for ecological conditions to support grizzly bears. Would also promote achievement of recovery.

Caves and Karst

Threats Addressed

- Recreation
- Mineral
- Energy Development

Plan Component

- FW-DC-Cave-01
- FW-STD-Cave-01

Plan Component Summary

Includes a desired condition and standard to maintain biological function of caves, karst. The forest wide desired condition FW-DC-CAVE-01 expresses a desire to maintain and protect cave features. The standard FW-STD-BIOPHY-01 specifies that cave environments shall not be altered, except where necessary to protect associated natural resources or to protect health and safety.

Effect

This direction would maintain and protect caves that that might contribute to hibernation sites for grizzly bears. These plan components are a relatively minor contributor to grizzly bear habitats.

Forestlands

Threats Addressed

- Vegetation Management
- Climate change
- Wildfires

Plan Component

- FW-DC-FOR-01
- FW-DC-FOR-02
- MA2 and MA3-DC-FOR-10
- MA3-DC-FOR-11
- MA3-STD-FOR-01
- MA3-GDL-FOR-06
- MA3-GDL-FOR-07
- MA2 and MA3-GDL-FOR-01
- MA2 and MA3-GDL-FOR-02
- MA2 and MA3-GDL-FOR-03
- MA2 and MA3-GDL-FOR-04
- MA2 and MA3-GDL-FOR-05
- MA2 and MA3-DC-FOR-10
- FW-DC-FOR-09

Plan Component Summary

Comprehensive plan components that would direct management to provide a diversity of forest conditions across multiple broad potential vegetation types. The basic premise is that forest will be managed to manage for variation of structure, function, composition, and connectivity of forested habitats, including forest size classes, density, dominance types, and landscape pattern for broad potential vegetation types. Restoring forested habitats back to conditions similar to those under natural disturbances will be the primary driver for management of forested habitats. Forested lands plan components are specific to broad potential vegetation types that provide the physical characteristics that provide for a variety of forest types. The section contains direction to restore western white pine, white bark pine and aspen. Several plan components address conditions that describe vegetation patterns that reflect fire regimes, and landscape patterns. These sections also contain plan standards and guidelines to ensure that snags, live leave trees, and downed wood remain distributed across the plan area and provide protections for old growth, which could contribute to hibernation or denning sites. Specific desired conditions and objectives seek to restore whitebark pine which will provide an important source of nutrition at long time periods from now.

Effect

Provide a diversity of forest vegetation conditions to support grizzly bear ecology. These plan components would ensure properly functioning habitat and a variety of dominance types, forest densities, composition, and size classes to provide for the diverse needs of grizzly bears. These plan components would direct forest management towards maintaining or restoring conditions that existed under natural disturbance. These should contribute to ecological conditions like those that grizzly bears evolved with. Early seral conditions would promote bear nutrition while forested lands in mature size classes would promote resting and denning structures. These would seek to restore some bear nutrition through restoration of white bark pine, and perhaps white pine. Desired conditions are such that forests would be more resilient to the effects of climate change and should address vulnerability to uncharacteristic wildfire. Timber production in many cases will be the result of restoration actions to restore ecosystem integrity.

Meadows, Grasslands, and Shrublands

Threats Addressed

- Vegetation Management
- livestock grazing
- wildfire

Plan Component

- FW-DC-GS-01
- FW-DC-GS-02
- FW-DC-GS-03
- FW-DC-GS-04
- FW-DC-GS-05
- FW-DC-GS-06
- FW-DC-GS-07
- FW-DC-GS-08
- FW-OBJ-GS-01

Plan Component Summary

Desired conditions describe the desired composition and condition of meadows, grasslands and shrublands. These plan components represent habitats where these features are persistent rather than a result from disturbance of forested habitats that create early seral forested conditions. These desired conditions are organized by grassland and shrubland types and describe the desired native plant composition. Objectives seek to maintain or expand these habitat features through disturbance.

Effect

Persistent non-forested habitats are relatively uncommon within the plan area as most of the land base is composed of forested habitats. These plan components help ensure that meadows, grasslands, and shrublands maintain composition to function properly and remain in extent to provide foraging resources for bears and their prey. Grazing allotments are often located where these features occur in abundance. Maintaining the composition of these habitats would require proper grazing intensities. Wildfire often maintains these habitats long term.

Fire Management

Threats Addressed

- Wildfire
- vegetation management
- climate change

Plan Component

- FW-DC-FIRE-01
- FW-DC-FIRE-02
- FW-OBJ-FIRE-01
- FW-OBJ-FIRE-02
- FW-OBJ-FIRE-02
- FW-GDL-FIRE-01
- FW-GDL-FIRE-02

Plan Component Summary

These are desired conditions and objectives that describe the desired landscape resiliency to fire, desired fuel conditions, spatial pattern, burn intensity and processes that are a large driver of ecological conditions in the plan area. Emphasizes that wildfire plays an integral part of achieving ecosystem sustainability, including interrelated ecological, economic, and social components, such as improved ecosystem resilience and wildlife habitat, protection of property, other values at risk, and public safety. Objective to treat acres of habitat to achieve desired conditions both through prescribed burning and vegetation treatments and wildfire. Guidelines require utilizing opportunity to integrate wildland fires into other disturbances on the landscape. Guidelines require that planned ignitions should be planned and implemented with design features to address the spread of invasive weeds.

Effect

Uncharacteristic wildfire (either too little or too much wildfire) was identified as a threat because it is pervasive and may play a large role in ecosystem changes that could impact productivity of the landscape for grizzly bears. In many areas of the Forest, fire exclusion has contributed to fuels conditions that may cause large, uncharacteristic wildfires. Similarly, fire exclusion has likely substantially reduced grizzly bear nutrition and perhaps carrying capacity. These plan components would serve to ensure that wildfire and prescribed fire continue to play a role to contribute to grizzly bear habitats and food sources. They would also help ensure that wildfire would be restored back to natural intensity and periodicity. Restoration of natural disturbance processes would improve function of forested ecosystems for grizzly bears. Restoring wildfire would help these systems be more resilient to the effects of climate change.

Invasive Species

Threats Addressed

- Wildfire
- vegetation management,
- Invasive species

Plan Component

- FW-DC-INV-01
- FW-OBJ-INV-01
- FW-GDL-INV-01
- FW-GDL-INV-02
- FW-GDL-INV-03

Plan Component Summary

Desired conditions, objectives and guidelines designed to ensure that invasive species do not significantly increase across the Nez Perce-Clearwater and no new invasive species become established in any of the plant communities or aquatic ecosystems on the Nez Perce-Clearwater.

Effect

Invasive species have the potential to invade to the exclusion of native vegetation. Natural grasslands, shrublands, and other xeric habitats are more prone to invasive weeds and could affect grizzly bear nutrition and the conditions for their prey. Some invasive species like blackberry invade riparian areas and may provide bear foods. These plan components help ensure that weeds do not invade and permanently alter grizzly bear habitats. Wildfire often interacts with invasive weeds which can change natural disturbance patterns. Objectives seek to treat invasive weeds and prevent spread and establishment. Plan direction for invasive species would have negligible effects on grizzly bears. The guidance in these plan components would help prevent and address invasive plant and animal species to help reduce impacts from wildfire, vegetation management, and invasive species.

Soils

Threats Addressed

- Motorized Access

Plan Component

- FW-DC-SOIL-01
- FW-DC-SOIL-02
- FW-DC-SOIL-03
- MA2 and MA3-GDL-SOIL-02
- MA2 and MA3-GDL-SOIL-05

Plan Component Summary

Establishes desired conditions for soils and provides standards and guidelines to maintain and restore soil function during and after project activities. MA2 and MA3-GDL-SOIL-02 specifies that temporary roads, skid trails, and landings should be located on existing disturbed areas before creating new soil disturbance. MA2 and MA3-GDL-SOIL-05 requires that after a road is decommissioned or after cessation of management activities on temporary roads, soil function appropriate to the site potential should be restored using demonstrably effective methods. MA2 and MA3-GDL-SOIL-02 requires that temporary roads, skid trails, and landings should be located on existing disturbed areas before creating new soil disturbance to limit additional soil disturbance.

Effect

Ensures that forest activities do not damage soils and restores them when disturbed. The forest vegetation relies on the integrity of soils to maintain productivity. These plan components ensure that soil conditions are maintained so they continue to support grizzly bear habitat. These would help to minimize creation of new temporary roads and help address unauthorized uses of decommissioned roads. Soil objectives propose restoration activities, which could displace bears or have a small chance of bear-human conflict, but those would have lower probabilities and would have at most short-term local impacts.

Aquatic Ecosystems

Threats Addressed

- Motorized Access
- Vegetation Management
- Recreation
- Livestock
- mineral and energy development
- wildfire.

Plan Component

- All plan components in Sections:
- Water and Aquatic Resources
- Riparian Management Zones
- Conservation Watershed Network
- Infrastructure (Aquatics and Riparian)
- Energy and Minerals (Aquatics and Riparian)
- Livestock Grazing (Aquatics and Riparian)
- Lands and Special Uses (Aquatics and Riparian)
- Recreation (Aquatics and Riparian)

Plan Component Summary

The water and aquatics resources section mostly addresses water quality, connectivity of aquatic systems, sediment, instream flows, and water temperature.

The Riparian Management Zones section addresses the condition and management of riparian areas. They are defined with one of four categories based on whether they are fish bearing or not, whether they flow year-round, or are still waters. Various activities are restricted within different distances of the edge of the flood plain based on the categories. Restricted activities include vegetation management, timber harvest, thinning, staging of vehicles or heavy equipment, refueling, and fuel storage, Fuelwood cutting, and direct ignitions. Additional activities are prohibited in most cases with exceptions and include landings, skidding, staging or decking, yarding, and machine burn piling, new road, trail, and landing construction, including temporary roads. Additionally, a number of fire suppression related activities are restricted or prohibited within riparian areas. Saleable minerals are also restricted within riparian areas.

Plan components in the Conservation Watershed Network emphasize conservation and restoration within watersheds important for at-risk fish species. In these watersheds, activities shall be designed and implemented in a manner that supports, and/or contributes towards the recovery of aquatic federally listed species and the achievement of aquatic and riparian desired conditions. It includes standards that require that when constructing or reconstructing roads, projects shall result in a net decrease in the hydrologic connectivity of the road system and stream channel network unless no further decreases are needed to meet desired conditions for Water and Aquatic Resources or Conservation Watershed Network. Standards prohibit new hydroelectric facilities and water developments shall not be located in the Conservation Watershed Network with exceptions only where the Forest Service has limited authorities.

Plan direction in the Infrastructure (Aquatics and Riparian) section address road, and the maintenance of the road system within riparian areas.

Energy and Minerals (Aquatics and Riparian) section includes standards and guidelines that address impacts to riparian areas from energy and mineral activities. These plan components address mineral operations, pollutants, infrastructure, and minimize adverse effects to aquatic and riparian- dependent resources in riparian management zones.

The Livestock Grazing (Aquatics and Riparian) section addresses impacts to riparian and aquatic resources from livestock use.

Lands and Special Uses (Aquatics and Riparian) section address impacts from special uses including hydropower infrastructure.

The Recreation (Aquatics and Riparian) section of the plan addresses impacts from recreation within riparian areas. The desired condition is that recreation sites and developments have minimal impacts to these habitats. Standards and guidelines restrict new sanitation facilities, new facilities, or infrastructure. They also provide guidance on how activities are performed to minimize impacts to water quality and riparian areas.

Aquatic and riparian plan components restrict or minimize motorized access in several sections. These include several plan components that seek to minimize the construction of roads within riparian areas including FW-DC-ARINF-01, FW-STD-ARINF-01, FW-GDL-ARINF-04, FW-GDL-ARINF-08, FW-GDL-RMZ-02, FW-STD-ARINF-01, FW-GDL-ARINF-04, FW-GDL-ARINF-08, FW- GDL-AREM -02. These are meant to minimize the impact of the transportation system on aquatic and riparian habitats. Objectives FW-OBJ-WTR-02, FW-OBJ-WTR-05, FW-OBJ-RMZ-01 specifically mention road decommissioning as objectives for riparian habitat restoration.

Effect

The aquatic and riparian ecosystem plan components provide a rigorous framework for the protection and restoration of aquatic and riparian habitats. Collectively, the restrictions on activities within riparian areas would result in the conservation of these areas for grizzly bear use and benefit. Riparian areas provide forage resources, travel corridors, and general habitat to grizzly bears. These plan components are designed to improve fishery resources that may contribute to high quality bear nutrition.

Measures that restrict motorized access in riparian areas represent a substantial restriction because they occur across all management areas and make up approximately 548,284 acres or about 14 percent of the plan area. This includes 233,201 acres of riparian habitats in areas suitable for motorized uses. While these restrictions apply in riparian areas, the restrictions may drive placement of roads and reconstruction of existing roads into upland habitats.

Because of their comprehensive nature, the aquatic plan components address several of the threats to grizzly bears, at least within riparian areas.

Wildlife

Threats Addressed

- Human-Bear Conflicts
- vegetation management (via landscape pattern)

Plan Component

- FW-GL-WL-01
- FW-DC-WL-01
- FW-DC-WL-06
- FW-DC-WL-07
- FW-DC-WL-08
- FW-DC-WL-07
- FW-GDL-WL-01
- FW-GDL-WL-05

Plan Component Summary

While the needs for most species are expected to be met through coarse filter ecosystem plan components such as those in the Forested Lands, Aquatic Ecosystem, and Meadows, Grasslands, and Shrublands sections, plan component in the wildlife section provide additional guidance for the management of wildlife habitats.

FW-GL-WL-01 is a forest plan goal for the Forest to work cooperatively with the U.S. Fish and Wildlife Service and other agencies on conservation strategies, recovery plans, habitat management, and ecological conditions towards recovery of federally listed threatened or endangered species.

FW-DC-WL-01 is a desired condition to provide habitat for federally listed threatened, endangered, and candidate plant and animal species that contribute to their recovery to the point at which listing is no longer appropriate. It also expresses a desire to provide conditions to meet their life history needs.

FW-DC-WL-03 is a desired condition that addresses landscape pattern to provide for connectivity.

This section includes three species specific desired conditions for grizzly bears. They include FW-DC-WL-06, FW-DC-WL-07, and.

FW-DC-WL-06 These would direct management to provide ecological conditions to support recolonization of grizzly bears within the Bitterroot Recovery Zone and allow travel from other recovery zones to the Bitterroot Recovery Zone. It specifies that allocations identified in the forest plan provide connectivity to allow secure passage from occupied habitat into the Bitterroot Recovery Zone.

FW-DC-WL-07 would encourage efforts by the forest to educate the public on grizzly bears and conflicts. It would encourage providing information and stipulations in issued permits for bear safety to reduce bear-human conflicts.

FW-DC-WL-08 would also encourage education on grizzly bear safety, and guide management to equip developed and administration sites infrastructure so that food, garbage, and other attractants can be made inaccessible to grizzly bears to reduce the potential of human-bear conflict.

FW-STD-WL-01 requires that Canada lynx habitat shall be managed in accordance with the Northern Rockies Lynx Management Direction and Record of Decision.

FW-GDL-WL-01 Reduces impacts to dispersal, migration, or critical habitat from communication lines and towers.

FW-GDL-WL-05 is a species-specific component for both elk and grizzly bears. This plan guideline acts as a constraint on new motorized trail construction within Idaho Roadless Rule Areas. It only applies to Idaho Roadless Rule areas that are within a motorized ROS setting. It would limit the amount and distribution of motorized trails in secure habitat patches 10,000 acres or larger within Idaho Roadless Rule Areas within motorized ROS settings. When constructing motorized trails in areas 10,000 acres or larger, it would require leaving areas 5000 acres or larger as a minimum after motorized trails are constructed. It would prohibit motorized trails in secure habitats between 10,000 acres and 5,000 acres with the exception that it would not apply within Community Protection Zones (defined in the Idaho Roadless Rule). It does not apply to secure habitats smaller than 5,000 acres in Idaho Roadless Rule Areas that are within a motorized ROS setting. The effects of this plan component were described in detail above. The guideline is not needed in Idaho Roadless Rule areas not suitable for motorized uses because no motorized uses would be allowed there.

Effect

There are three species-specific desired conditions for grizzly bears and one species-specific guideline. There are also plan components for other wildlife species that would indirectly benefit grizzly bears. These plan components are intended to provide management or direction for federally listed species, support recolonization of the Bitterroot Ecosystem by grizzly bears, provide for connectivity, increase public awareness and education about bear safety, and direct management to provide infrastructure for food storage in recreation sites. They also provide for other wildlife species that support grizzly bear prey. FW-DC-WL-01 would provide conditions for federally listed species. FW-DC-WL-03, FW-DC-WL-06, and FW-GDL-WL-05 would promote conservation of secure habitat in Idaho roadless Rule Areas which will aide connectivity for grizzly bears. FW-STD-WL-01 requires that the Forest follow the Northern Rockies Lynx Management Direction, which could indirectly benefit grizzly bears.

Multiple Uses-Wildlife

Threats Addressed

- Motorized Access
- Recreation
- Vegetation management
- Wildfires

Plan Component

- FW-GDL-WLMU-01
- FW-DC-WLMU-03
- FW-DC-WLMU-05

- MA1-DC-WLMU-01
- MA2-DC-WLMU-01
- MA2-DC-WLMU-02
- MA3-DC-WLMU-01
- FW-DC-WLMU-06
- FW-DC-WLMU-07
- FW-GDL-WLMU-01
- FW-GDL-WLMU-03
- MA3-GDL-WLMU-01

Plan Component Summary

FW-GDL-WLMU-01 is a guideline that ensures that when closing routes to motorized use, to ensure benefits to wildlife habitat are realized, that measures would be included to sufficiently exclude motorized use on closed routes.

FW-GDL-WLMU-02 is a guideline where the intent is to reduce barriers to big game movements when constructing new fences.

FW-DC-WLMU-02 Guidance that should direct management of habitat to provide conditions to meet life history requirements year-round for ungulates. Additionally, it would guide management to help ensure that habitats are composed of native plants.

FW-DC-WLMU-04 Emphasizes that natural processes contribute to the mosaic of habitats needed by ungulates.

FW-GDL-WLMU-03 Seeks to protect wintering big game from disturbance activities.

FW-DC-WLMU-06 is the overarching desired condition to provide for elk. It emphasizes maintaining habitat use and nutrition. This desired condition also would direct management to address invasive weeds in elk habitats.

FW-DC-WLMU-07 describes the desired distribution of elk. Elk distribution is often affected by motorized access. It specifically addresses the desire that motorized access does not affect use of nutritional resources by elk.

MA1-DC-WLMU-01 describes how the desired vegetation conditions in Management Area 1 is through natural processes and are composed of native plants.

MA2-DC-WLMU-01 would direct management to provide between 10-20 percent of the landscape to provide for elk moderate to high quality forage.

MA3-DC-WLMU-01 is a desired condition meant to encourage providing nutrition away from open motorized access. It specifies that ten to twenty percent of the Management area provides moderate or high-quality nutrition for elk and that a portion of that habitat is occurs greater than 0.5 miles from open motorized routes.

MA2-DC-WLMU-02 is a desired condition that areas at least 5,000 acres in size exist without motorized access open to the public to maintain habitat use by elk.

MA3-GDL-WLMU-01 Treatments designed to improve elk habitat should focus on one or more of the habitat covariates likely to improve predicted cow elk body fat condition. The guideline has an associated management approach that describes the framework that identifies the four habitat covariates and process that would be used in evaluating project effects on elk habitat and improve habitat conditions for elk (see the elk potential management approaches in the appendix to the Biological Assessment).

Effect

While these plan components emphasize ungulates and are intended to benefit species commonly used by the public for hunting, fishing, gathering, trapping, and other uses, these plan components indirectly benefit grizzly bears. Desired condition FW-GLD-WLMU-02 would encourage vegetation management to provide for ungulates year-round including summer and winter seasons. Early seral conditions would benefit both bears and ungulates by increasing nutrition through both ungulate protein and through improved herbaceous nutrition. Additionally, this direction would encourage the use of natural processes like wildfire would contribute to wildlife habitats. Protecting winter range from disturbance would also benefit grizzly bears from both a disturbance and food source standpoint. Bears often look for carcasses on winter ranges when they emerge from their dens. Essentially providing for ungulates increases nutrition for grizzly bears. Management towards reducing unauthorized motorized uses on closed roads or motorized trails would help reduce the impact of motorized access outside the designated road system.

Elk specific plan components (FW-DC-WLMU-06, FW-DC-WLMU-07, MA2-DC-WLMU-01, MA3-DC-WLMU-01, MA2-DC-WLMU-02, and MA3-GDL-WLMU-01) provides a framework for the management of elk habitats which emphasize habitat use and nutrition. Maintaining habitat use often requires reduction or prevention of motorized access. In addition, these plan components contribute to grizzly nutrition by providing for early successional resources that will provide for both elk and bear nutrition. These measures are intended to improve elk populations which would also result in ungulate protein for grizzly bears. Elk plan components encourage providing nutrition that are located away from motorized access. These plan components provide direction specific to the management areas with particular emphasis in Management Areas 2 and 3.

In management area 3 plan guideline MA3-GDL-WLMU-01 require improving cow body fat. The Potential Management Approaches provides an integration of four factors known to affect elk habitat use which are: 1) nutritional quality of forage resources, 2) increasing distances from roads (areas ½ miles or more away from open motorized access), 3) habitat factors on slopes less than 40 percent and 4) improved habitat interspersion by factors such as increased edge to interior ratios, a mix of mature and open habitats, decreased distance from nutrition to forest edges, or other landscape patterns that facilitate elk selection. Nutrition must be usable by elk and distance from roads is one factor that allows nutrition to be usable. Additional information about how this is envisioned to work is provided in elk potential management approaches. The basic premise is to evaluate all these factors together during project development and make strategic decisions to increase habitat use and nutrition. In some cases, secure habitat would increase as a result of increasing distance from roads so that nutritional resources would be useable by elk. Elk plan components address motorized access, vegetation management, and would break up contiguous fuels so that wildfires would be less severe.

Sustainable Recreation

Threats Addressed

- Motorized Access
- Recreation

- Bear-human conflicts

Plan Component

- FW-DC-REC-04
- FW-DC-REC-13
- FW-STD-REC-01
- Suitability plan components

Plan Component Summary

These plan components provide direction as to how recreation is to be managed. Those related to grizzly bear conservation are those that enforce recreation opportunity spectrum settings, especially those that address motorized access and the levels of development for recreation facilities.

FW-DC-REC-04 specifies that the type and level of infrastructure, and visitor services are sustainable and consistent with the Recreation Opportunity Spectrum settings. This is helpful since vast areas of the forest are in primitive, and semi-primitive settings that would be managed. Since several areas of the forest are in primitive, and semi primitive settings, this desired condition would direct management to be consistent with these settings.

FW-DC-REC-13 specifies that trails including motorized trails, not needed to serve management or public needs and purposes are absent. This would help ensure that there is not a proliferation of these features and direct management to remove or close areas that are not needed.

Standard FW-STD-REC-01 requires that construction, reconstruction, and maintenance of recreation facilities and trails shall be consistent with the recreation opportunity spectrum classes designations and specialized plans (e.g., such as wilderness, recreation corridor, river management, scenic byway, and trail management plans) as appropriate.

Effect

These are the primary plan components that enforce Recreation Opportunity Spectrum Settings. Recreation opportunity spectrum settings that support less development and primitive or semi-primitive settings would provide lower levels of development, more rustic infrastructure, and a more natural setting that would be better for grizzly bear occupancy. Recreation settings, such as those for non-motorized settings prohibit motorized uses, road construction, and other developments that could impact grizzly bears. Suitability plan component in this section cement that motorized travel, permanent road construction, and temporary road construction are not allowed within primitive and semi-primitive-non motorized settings.

Public Information, Interpretation, and Education

Threats Addressed

- Human-bear conflicts

Plan Component

- FW-DC-ED-01

Plan Component Summary

A desired condition to provide interpretation and educational opportunities enhance the visitor's understanding and appreciation for the rich natural and cultural history of the Nez Perce-Clearwater. This desired condition specifically mentions wildlife in general but could also include information about grizzly bear ecology and safety.

Effect

Would direct management towards increasing education and interpretation opportunities which may include grizzly bear topics to assist in educating the public about grizzly bear issues.

Infrastructure

Threats Addressed

- Motorized Access

Plan Component

- FW-DC-INF-02
- FW-OBJ-INF-01

Plan Component Summary

FW-DC-INF-02 is a desired condition that roads not needed to serve management and public needs and purposes are absent. Plan direction in the infrastructure section emphasizes the maintenance and condition of roads and structures. These plan components would not increase or cause more roads or trails.

FW-OBJ-INF-01 is an objective to complete road work, such as reconstruction; re-routing; road improvements; decommissioning; or placing roads in intermittent stored service, every 5 years. It also priorities reducing effects on desired aquatic and riparian conditions from chronic sediment delivery or potential future road prism failures, including previously decommissioned roads where drainage features have failed.

Effect

This desired condition should direct management to minimize the road system to only those roads needed for specific purposes and would serve to reduce these features. The maintenance levels of roads are set base upon recreation opportunity spectrum settings and travel management decisions. By themselves, these plan components have little effect on grizzly bears other than when roads or buildings are maintained. In that case, the effects might be temporary displacement. Some plan direction within this section would decrease some roads. This direction would help minimize unneeded roads, which could serve to reduce the impacts to secure habitat for grizzly bears. Objective FW-OBJ-INF-01 would improve conditions for grizzly bears over time and may increase secure habitat.

Suitability

Threats Addressed

- Motorized Access
- Recreation
- Vegetation management
- Human bear-conflicts

- livestock grazing
- mineral and energy development
- wildfires

Plan Component

- Plan components found in the table in Suitability section of the plan

Plan Component Summary

Identifies areas as suitable or not for a variety of uses. Prohibits or allows a variety of activities within different land management allocations such as designated wilderness, recommended wilderness, Designated Wild and Scenic Rivers or areas suitable for timber production for example. If an activity is not suitable within an area, that activity would not be allowed under the plan within the specified area. If on the other hand, the activities are identified as suitable those activities would be allowed within those areas in the future after a project level analysis and consultation. Activities included in suitability determinations include timber production, timber harvest, permanent road construction, temporary road construction, prescribed fire, livestock grazing, minerals- saleable, minerals-locatable, minerals leasable, new facilities, motorized recreation, over-snow motorized recreation, mechanical transport recreation travel.

Timber production and harvest suitability was analyzed in detail in the Timber Suitability, Production, Harvest, and Vegetation Restoration section above and is not discussed further here.

Suitability plan components restrict motorized access via restrictions on permanent road construction, temporary road construction, and motorized travel. These were analyzed in detail in the Effects of Motorized Access Section above.

Prescribed fire is suitable everywhere. This would allow this activity throughout the plan area.

Suitability for livestock grazing was evaluated within the Effects of Rangeland Management and Domestic Livestock Grazing section above.

Suitability for minerals was analyzed within the Effects of Minerals and Energy section above.

New facilities are unsuitable in many areas including the Landmark Historic Corridor, Designated Wilderness, Recommended Wilderness, Designated wild and scenic rivers within the wild classification. They are also unsuitable in the following Idaho Roadless Rule themes: Wildland Recreation, Primitive and special areas of historic or tribal significance, and backcountry restoration themes. They are only suitable in Idaho roadless rule within the Community Protection Zones. They are also not suitable within the primitive recreation opportunity spectrum setting, Riparian Management Zone, Mass movement areas, and Research Natural Areas.

Motorized over-snow travel is unsuitable in designated wilderness, recommended wilderness, and non-motorized winter recreation opportunity spectrum settings.

Mechanical transport includes mechanical activities such as bicycling. These are unsuitable within Wilderness, Recommended Wilderness but are otherwise suitable across the forest.

Effect

These are broad brush plan components that find activities suitable or not within specific areas of the forest. An activity can be suitable, unsuitable, or conditionally suitable. Some of these activities are known to affect grizzly bears and their habitat. Effects are closely tied to land management allocations. In many cases, these activities are not suitable and thus prohibited across broad areas. Thus, where activities are unsuitable, threats to grizzly bears are reduced or eliminated.

Threats addressed though suitability include timber, construction of permanent roads, construction of temporary roads, motorized recreation or travel, mineral activities, construction of new facilities, motorized over-snow transportation, and mechanical transportation.

Suitability of uses differs for each activity and each land type as identified in the Suitability section of the plan. However, some generalizations can be made. Designated areas like wilderness, wild and scenic rivers, research natural areas and the Landmark Historic corridor have fewer suitable uses, or in other words more activities are not suitable, and will not be allowed under the plan. Similarly, areas recommended for designation, such as recommended wilderness, and suitable wild and scenic rivers typically have many uses that are unsuitable. Other areas like the Idaho roadless rule areas have a variety of activities that are either unsuitable or conditionally suitable. The elimination of these activities from large areas via suitability plan components prevents effects to grizzly bears.

Timber production is unsuitable on about 73.5 percent of the forest. Timber harvest of any kind is unsuitable on about 58.7 percent of the forest.

Prescribed fire being suitable everywhere will allow the forest to address habitat changes as a result of fire exclusion and uncharacteristic wildfire. Prescribed fire would diversify grizzly bear habitat and provide for better nutrition.

New facilities are not suitable in many areas of the forest especially those with high value to grizzly bears such as wilderness and most Idaho Roadless Rule theme areas. This would prevent development of new facilities in these areas which would maintain grizzly bear habitat.

Areas where winter-motorized recreation is unsuitable includes areas important to grizzly bears. Wilderness areas and recommended wilderness areas would prevent this activity from occurring within these areas which make up substantial acres within the plan area. This would prevent impacts to denning bears in these areas.

Mechanized transport suitability would protect the grizzly bear Recovery Zone and recommended wilderness areas from this activity. This would prevent impacts from mechanized travel such as bicycles.

Timber

Threats Addressed

- Vegetation management

Plan Component

- FW-DC-TBR-04
- FW-STD-TBR-01
- FW-STD-TBR-02
- FW-STD-TBR-03
- FW-STD-TBR-04
- FW-STD-TBR-05

- FW-GDL-TBR-01

Plan Component Summary

These plan components direct how and where timber harvest and production is to proceed. These plan components would help support ecological conditions for grizzly bears, especially within areas not suitable for timber production. Plan standard FW-STD-TBR-01 specifies that harvest for timber production shall only occur on lands classified as suitable for timber production. Standard FW-STD-TBR-02 specifies that on lands identified as not suitable for timber production but where timber harvest could occur should only be used as a tool to protect other multiple-use values and for salvage, sanitation, or public health or safety. Plan standard FW-STD-TBR-03 would protect soil, slope, and watershed conditions from being irreversibly damaged. Plan standards would ensure that forest stands would be restocked as in FW-STD-TBR-04. Standard FW-STD-TBR-05 specifies that silvicultural treatments shall be selected based on their ability to meet desired conditions and not based solely on economics or unit output of timber. Guideline FW-GDL-TBR-01 specifies that timber harvest within areas not suitable for timber production should only occur for such purposes as salvage, fuels management, insect and disease mitigation, protection or enhancement of biodiversity or wildlife habitat, meeting desired conditions, to perform research or administrative studies, or recreation and scenic-resource management consistent with other multiple use and management direction. They also identify only a portion of the plan area as suitable for timber production, with the majority not suitable.

Effect

These plan components ensure timber production is conducted in a sustainable manner and only in suitable areas. Areas not suitable for timber production protects grizzly bear habitat from this activity altogether. The effects are that the majority of the forest would not be subject to this activity.

Additional areas are suitable for timber harvest but not production. Timber harvest may be used as a tool for the purpose of maintaining or restoring other resource values in lands not suited for timber production. Examples include maintaining a healthy, visually pleasing forest in the recreation segment of a wild and scenic river corridor or reducing fire hazard in the wildland urban interface or riparian conservation areas. These plan components should help ensure that grizzly bear habitats are managed in a sustainable manner in relation to timber harvest. Areas suitable for timber harvest but not production include about 586,014 acres total or about 14.8 percent of the forest. These activities typically restore vegetation to desired conditions.

Energy and Minerals

Threats Addressed

- Mineral and Energy Development

Plan Component

- FW-STD-EM-01

Plan Component Summary

Directs how energy and mineral activities would occur. FW-STD-EM-01 Ensures that mining activities shall only be authorized when the associated reclamation plan includes provisions to return disturbed areas to a state of site condition comparable to pre-mineral activity.

Effect

Helps ensures that areas impacted by mining would be restored after mineral activities are completed. This will help restore some areas impacted by mining activities. This would be helpful to restore some grizzly bear habitats.

Livestock Grazing

Threats Addressed

- Livestock allotments

Plan Component

- FW-GDL-GRZ-01
- FW-GDL- GRZ-03

Plan Component Summary

FW-GDL-GRZ-01 Directs that livestock salting should be excluded from riparian areas, meadows, designated sensitive plant habitat, seedling conifer regeneration areas, aspen restoration areas, and prescribed restoration areas. FW-GDL-GRZ-03 requires that forage utilization should not exceed 35 to 55 percent.

Effect

Ensure grazing is conducted sustainably, leaving habitat in good condition for grizzly bears.

FW-GLD-GRZ01 would prevent trampling and concentrated uses areas within habitats that may be important to grizzly bears such as meadows, and riparian areas.

FW-GLD-GRZ-03 would ensure that grizzly bear habitats are not overutilized and that they maintain plant vigor and abundance of species despite grazing pressure.

Designated Wilderness Areas

Threats Addressed

- Motorized Access
- Vegetation management

Plan Component

- MA1-DC-WILD-01
- MA1-STD-WILD-01
- MA1-SUIT-WILD-01
- MA1-SUIT-WILD-02
- MA1-SUIT-WILD-03
- MA1-SUIT-WILD-04
- MA1-SUIT-WILD-05
- MA1-SUIT-WILD-06

- MA1-SUIT-WILD-07
- MA1-SUIT-WILD-08
- MA1-SUIT-WILD-09
- MA1-SUIT-WILD-10
- MA1-SUIT-WILD-11

Plan Component Summary

MA1-DC-WILD-01 would direct management to ensure that natural ecological processes and disturbances (e.g., succession, wildfire, avalanches, insects, and disease) are the primary forces affecting the composition, structure, and pattern of vegetation.

MA1-STD-WILD-01 requires that management activities within designated wilderness areas shall preserve and protect wilderness character as required by the Wilderness Act, as well as each wilderness area's enabling legislation and its specific management plan.

Suitability was addressed above but essentially timber harvest, timber production, permanent road construction, temporary road construction, mineral extraction (except for those established prior to January 1, 1989), new facilities, motorized recreation, motorized over snow travel and mechanized transport are all unsuitable and prohibited in wilderness areas. Livestock grazing is suitable per designating legislation.

Effect

These plan components remove many threats and should maintain ecological conditions to contribute to recovery, especially within the Bitterroot Recovery Zone. Standards that require management to maintain wilderness character would prevent any actions not consistent with wilderness management. These would protect grizzly bear habitats. Suitability reduces or prevents many activities known to impact grizzly bears. These apply to designated wilderness that makes up the Bitterroot Recovery Zone, but also the gospel hump wilderness area.

Designated Wild and Scenic Rivers

Threats Addressed

- Motorized access
- vegetation management
- wildfires

Plan Component

- MA1-DC-DWSR-01
- MA1-STD-DWSR-01
- MA1-STD-DWSR-02
- MA1-SUIT-DWSR-01
- MA1-SUIT-DWSR-01
- MA1-SUIT-DWSR-03
- MA1-SUIT-DWSR-04

- MA1-SUIT-DWSR-05
- MA1-SUIT-DWSR-06
- MA1-SUIT-DWSR-07
- MA1-SUIT-DWSR-08
- MA1-SUIT-DWSR-09
- MA1-SUIT-DWSR-10
- MA1-SUIT-DWSR-11

Plan Component Summary

Desired condition MA1-DC-DWSR-01 would direct management so that designated wild, scenic, and recreational rivers retain their free-flowing condition, water quality, and the outstandingly remarkable values for which the river was designated.

Standard MA1-STD-DWSR-01 Requires that management activities in designated wild and scenic river corridors shall comply with their individual comprehensive river management plans.

MA1-STD-DWSR-02 requires that Management activities in designated wild and scenic river corridors shall maintain their free-flowing character, water quality and outstandingly remarkable values for which the river was designated.

The plan identifies uses that are suitable or not within wild and scenic rivers. These were analyzed in detail above

Effect

These plan components would help ensure that designated wild and scenic rivers would contribute habitat conditions for grizzly bears because they are managed to conserve free flowing condition, and outstandingly remarkable values within the river corridor (¼ mile of the river on either side). Outstandingly remarkable values include values for recreation, scenery, wildlife, geology, fisheries, and cultural outstandingly remarkable values. All these values must be protected which indirectly protects these areas for future grizzly bear use. “Free flowing” as applied to any river or section of a river means existing or flowing in a natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway (as defined in the Wild and Scenic River Act). The requirement to maintain free flow would prevent alteration of these rivers.

Timber production is not suitable in wild and scenic river corridors, timber harvest is allowed under some circumstances, and road construction is restricted in areas designated as wild but not under recreational rivers. Some mineral extraction, motorized travel, and road construction is limited within wild rivers corridors. Restrictions on these activities would help to protect these areas from alteration and maintain conditions that could benefit grizzly bears.

Recommended Wilderness

Threats Addressed

- Motorized access
- vegetation management
- wildfires

Plan Component

- MA2-DC-RWILD-01
- MA2-DC-RWILD-02
- MA2-DC-RWILD-03
- MA2-OBJ-RWILD-01
- MA2-STD-RWILD-01
- MA2-STD-RWILD-02
- MA2-GDL-RWILD-01
- MA2-SUIT-RWILD-01
- MA2-SUIT-RWILD-02
- MA2-SUIT-RWILD-03
- MA2-SUIT-RWILD-04
- MA2-SUIT-RWILD-05
- MA2-SUIT-RWILD-06
- MA2-SUIT-RWILD-07
- MA2-SUIT-RWILD-08
- MA2-SUIT-RWILD-09
- MA2-SUIT-RWILD-10
- MA2-SUIT-RWILD-11
- MA2-SUIT-RWILD-11
- MA2-SUIT-RWILD-12
- MA2-SUIT-RWILD-13
- MA2-SUIT-RWILD-14
- MA2-SUIT-RWILD-16
- MA2-SUIT-RWILD-17
- MA2-SUIT-RWILD-18
- MA2-SUIT-RWILD-19
- MA2-SUIT-RWILD-20

Plan Component Summary

MA2-DC-RWILD-01 is a desired condition that Recommended wilderness areas maintain their existing wilderness characteristics to preserve opportunities for inclusion in the National Wilderness Preservation System.

MA2-DC-RWILD-02 would direct management so that recommended wilderness areas are characterized by a natural environment where ecological processes and disturbances (e.g., natural succession, fire, avalanches, insects, and diseases) are the primary forces affecting the composition, structure, and patterns of vegetation.

MA2-DC-RWILD-03 would direct management to ensure that recommended wilderness areas facilitate the connectivity and movement of wildlife species across the Nez Perce-Clearwater by remaining large areas with little human activity.

MA2-OBJ-RWILD-01 is an objective that seeks to ensure activities within recommended wilderness areas are consistent with plan suitability components within five years.

MA2-STD-RWILD-01 requires that summer recreation opportunities shall be compatible with the appropriate recreation opportunity spectrum classification of primitive or semi-primitive non-motorized.

MA2-STD-RWILD-02 requires that winter recreation opportunities shall be compatible with the appropriate recreation opportunity spectrum classification of primitive or semi-primitive non-motorized.

MA2-GDL-RWILD-01 requires that if fire management actions are required within recommended wilderness, the Forest Service should apply minimum impact strategies and tactics to manage wildland fire that protect wilderness characteristics, unless more direct attack is needed to protect life or adjacent property or mitigate risks to responders.

Suitability plan components were analyzed above but essentially, most uses within recommended wilderness are unsuitable or conditionally suitable where the activities are allowed consistent with Idaho Roadless Rule.

Effect

These plan components should help ensure that recommended wilderness areas would remain in a natural and wild state. It would promote ecological conditions to provide for grizzly bear habitat. These areas would provide for connectivity and secure habitat for Grizzly bears. They would be managed largely by natural disturbances.

Standards MA2-STD-RWILD-01 and MA2-STD-RWILD-02 and suitability components ensure that these areas remain free from motorized uses.

Eligible and Suitable Wild and Scenic Rivers

Threats Addressed

- Motorized Access
- Recreation
- vegetation management
- mineral and energy development

Plan Component

- MA2-DC-E&SWSR-01
- MA2-STD-E&SWSR-01
- MA2-STD-E&SWSR-02
- MA2-GDL-E&SWSR-02

- MA2-SUIT-E&SWR-01 through MA2-E&SWR-22

Plan Component Summary

MA2-DC-E&SWSR-01 would direct management to ensure suitable wild, scenic, and recreational rivers retain their free-flowing condition, preliminary classification, and the outstandingly remarkable values that provide the basis for their inclusion in the system.

MA2-STD-E&SWSR-01 Prohibits the authorization or construction of roads, trails, facilities, or airstrips that would alter the classification of the river.

MA2-STD-E&SWSR-02 Applies to suitable wild river segment corridors. It prevents authorization or construction of roads outside of the corridor that would adversely affect the wild classification of the river.

MA2-GDL-E&SWSR-02. Would restrict new road, trail, and airfield construction so that should be designed to maintain the outstandingly remarkable values, classification, free-flowing character, and water quality of the river.

Suitability was analyzed above but would essentially be managed similar to designated wild and scenic rivers. Rivers in the wild classification have more restrictions and do not allow timber production, permanent road construction, temporary road construction, reconstruction of roads, mineral materials - saleable, major facility construction, motorized over snow vehicle use, and motorized travel. Activities in other classes of rivers are conditionally allowed such as when needed to maintain a primitive recreation experience and/or to protect users and/or to protect outstandingly remarkable values.

Motorized travel is generally not compatible with a Wild classification. Where motorized travel options are deemed to be necessary, such uses should be carefully defined and impacts mitigated. Motorized travel in Scenic and Recreational classifications may be permitted, prohibited, or restricted to protect outstandingly remarkable values.

Effect

Effects are similar to designated wild and scenic rivers. These plan components would help protect habitats ¼ mile around eligible rivers and would contribute to grizzly bear habitats indirectly through management to maintain free flowing characteristics and outstandingly remarkable values. Similarly, prohibitions on suitability of uses would help conserve these habitats.

Idaho Roadless Rule Areas

Threats Addressed

- Motorized Access
- Recreation
- vegetation management
- mineral and energy development

Plan Component

- MA2-DC-IRA-01
- MA2-DC-IRA-02
- MA2-DC-IRA-03

- MA2-DC-IRA-05
- MA2-STD-IRA-01
- MA2-SUIT-IRA-01 through MA-SUIT-IRA-11

Plan Component Summary

MA2-DC-IRA-01. Roadless Areas maintain the roadless characteristics and themes assigned to them in the Idaho Roadless Rule.

MA2-DC-IRA-02. The composition, structure, and pattern of vegetation reflect natural disturbances and follow Idaho Roadless Rule themes, as assigned.

MA2-DC-IRA-03. Roadless areas contribute habitats for wide ranging species and connectivity for movement of wildlife. These areas also provide foraging, security, denning, and nesting habitat for wildlife.

MA2-DC-IRA-05. Habitat configuration, distribution, and composition provide ecological conditions that increase elk herds.

MA2-STD-IRA-01. The provisions in the Idaho Roadless Rule (36 CFR 294 Subpart C) shall take precedence over any inconsistent land management plan component unless and until the rule is amended. Land management plan components that are not inconsistent with the Idaho Roadless Rule will continue to provide guidance for projects and activities within Idaho Roadless Areas and those related to protection of threatened and endangered species (36 CFR 294.28(d)).

Suitability within Idaho Roadless Rule were designed to be consistent with the rule and was analyzed above. Activities that are suitable or not depend upon the roadless rule theme, with Wildland recreation theme areas being the most restrictive while the Backcountry Restoration theme is least restrictive. Some activities are only conditionally suitable.

Effect

Roadless rule areas would be managed consistent with the Idaho Roadless Rule. Vegetation management would seek to maintain the composition, structure and pattern that reflect natural disturbances. Desired condition MA2-DC-IRA-03 would direct management to provide connectivity for wildlife, including grizzly bears, within the Idaho Roadless Rule Areas. Plan direction for Idaho Roadless Rule areas prevents activities like road construction and timber production that can affect conditions for grizzly bears. Direction to increase elk herds would contribute to bear nutrition. Suitability plan components are consistent with the Idaho Roadless Rule and will help provide ecological conditions for grizzly bears.

Research Natural Areas

Threats Addressed

- Motorized Access
- Recreation
- Vegetation management
- Mineral and energy development

Plan Component

- MA2-DC-RNA-01

- MA2-STD-RNA-01
- MA2-STD-RNA-02
- MA2-SUIT-RNA-01 through MA2-SUIT-RNA-11

Plan Component Summary

Desired Condition MA2-DC-RNA-01 would direct management to maintain a representation of natural systems as a baseline for research, monitoring, and education by the agency, academia, and public interests. Additionally, these areas would be managed so that wildfire, insects, and pathogens, along with other processes and disturbances, continue to affect vegetation, reflecting the dynamic nature of the systems they represent. Research natural areas contribute to ecological sustainability and biological diversity.

MA2-STD-RNA-01 Does not allow collection of forest products.

MA2-STD-RNA-02 Will not allow or authorize uses that threaten or interfere with the objectives or purposes for which a research natural area is established consistent with the desired condition above.

The following activities are unsuitable in Research Natural Areas: Timber production, Timber harvest, Permanent Road construction, temporary road construction leasable minerals, mineral materials, new facilities, and motorized recreation.

Effect

These areas make up a small percent of the plan area but management within them would maintain grizzly bear habitat there. Timber production, harvest, road building, temp roads, mineral extraction, construction of new buildings, and motorized travel are prohibited and thus would protect these areas from those impacts. Management emphasis is on maintaining natural conditions which should maintain habitats for grizzly bears.

Lolo Trail National Historic Landmark

Threats Addressed

- Motorized Access
- vegetation management
- mineral and energy development

Plan Component

- GA-GDL-NHL-05

Plan Component Summary

GA-GDL-NHL-05 states; "New temporary or permanent road and trail construction should not be permitted within the Landmark unless the integrity of the National Historic Landmark is maintained, and the purpose of the action is to benefit the National Register integrity of the Landmark."

Suitability plan components find timber production, timber harvest, livestock grazing, leasable mineral extraction, mineral materials, new building construction as unsuitable. Permanent and temporary road construction are only suitable if the integrity of the National Historic Landmark is maintained.

Effect

These areas would be maintained for grizzly bear by this management. Maintain habitats for grizzly bears by preventing some actions known to impact grizzly bears. Management emphasizes managing wildfire to operate as the disturbance regime.

Summary

The overarching theme of vegetation management is to manage the forest in a sustainable manner based on natural range of variation, with an emphasis on timber production limited to Management Area 3. The plan contains no direction to restrict road or motorized trail densities other than those within the multiple uses elk plan components, or those that apply within specific management areas such as recommended wilderness, recreation, suitable wild and scenic rivers, research natural areas, eligible and suitable wild and scenic rivers, and the National Historic Landmark. Instead, it relies on existing regulations found in law or regulation for Idaho Roadless Rule, designated wilderness, designated wild and scenic rivers, and designated research natural areas to maintain low road densities and secure habitat. An additional layer of management is included in the recreation opportunity spectrum alternatives that were analyzed in detail above, where decisions about suitability of uses are made across broad areas, including motorized travel and recreational development.

Monitoring Plan

The monitoring plan sets out the plan monitoring questions and associated indicators and measures. Every monitoring question links to one or more goals, desired conditions, objectives, standards, or guidelines but not every plan component needs to be monitored. Monitoring provides the feedback for the planning cycle by testing assumptions, tracking relevant conditions over time, measuring management effectiveness, and evaluating effects of management practices. Monitoring information should enable the national forest staff to determine if a change in plan components or other plan management guidance may be needed, forming a basis for continual improvement and adaptive management. Direction for the monitoring and evaluation of plans is found under the 2012 planning rule at 36 Code of Federal Regulations 219.12 and in the directives at 1909.12 chapter 30. The monitoring program will include a biennial monitoring evaluation report. The biennial monitoring evaluation report will summarize the results of monitoring, evaluate the data, consider relevant information from broad-scale or other monitoring efforts, and make recommendations to the responsible official. Biennial monitoring evaluation reports help determine if and where changes are needed in plan components, other plan content, and project activities (36 CFR 219.5).

The monitoring plan is included as appendix 3 of the Forest Plan and establishes monitoring to evaluate the plan components. The relevant grizzly bear monitoring elements are also displayed in Table 123.

Table 123. Revised Forest Plan grizzly bear monitoring elements

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
FW-DC-WL-06 The grizzly bear Bitterroot Recovery Zone provides the ecological conditions to support recolonization of grizzly bears. Land Management Plan land use allocations provide connectivity to allow secure passage from occupied habitat to the Bitterroot Recovery Zone. **FW-DC-WL-07** The risk of grizzly bear-human conflict is reduced through awareness. The public, Forest Service employees, contractors, volunteers, and permittees are knowledgeable of conflict prevention strategies through education and interpretation. **FW-DC-WL-08** Within occupied grizzly bear habitat, developed recreation sites, administrative sites, and dispersed recreation sites where garbage disposal services are provided, facilities are equipped with necessary infrastructure so that food, garbage, and other attractants can be made inaccessible to grizzly bears to reduce the potential of human-bear conflict. **FW-DC-WL-09** Wide-ranging species are free to move across and between habitats, allowing for dispersal, migration, genetic interaction, and species recruitment.	**MON-WL-09** Is the Forest participating in the Bitterroot Ecosystem subcommittee, or an equivalent science-based committee to understand best available scientific information and best practices? **MON-WL-10** How has the Forest reduced negative impacts to Grizzly Bears during project planning? **MON-WL-11** Are appropriate measures in place to reduce human-grizzly bear conflict due to sanitation issues? **MON-WL-12** Are travel planning projects addressing Grizzly Bear security when appropriate?	Number of Bitterroot Ecosystem subcommittee meetings the Nez Perce-Clearwater NFs participates in. Number of avoidance or minimization measures utilized during project planning; number of biological opinions with conservation recommendations regarding grizzly bear Number of storage orders currently in place and number of new or improved facilities installed. Number of travel plan decisions that include actions to address grizzly bear security.	Planning Administrative Reviews & Litigation System (PALS) Infrastructure (Infra) database

In addition, monitoring for grizzly bears is conducted cooperatively with the Interagency Grizzly Bear Committee and Subcommittee. These monitoring efforts are ongoing and expected to continue after the plan is finalized. The Nez Perce Clearwater National Forest actively participates in these organizations and coordinates monitoring efforts.

Potential Management Approaches

The plan contains a Potential Management Approaches section that describes the Forest's intent to manage grizzly bear habitat as bears move into the area. It describes the purpose of the plan components related to grizzly bears, describes how the plan components and land allocations in the plan work together to contribute to recovery of grizzly bear, and identifies possible management strategies and approaches. Topics include participation by the Nez Perce-Clearwater National Forest as a member of the Bitterroot Ecosystem subcommittee in order to understand best available science and best practices regarding grizzly bears in the Bitterroot Ecosystem and support recovery in the Bitterroot Recovery Area. Potential Management approaches also describe the use of minimization measures and conservation recommendations by the Bitterroot Ecosystem Subcommittee including sanitation plans, infrastructure and reducing attractants. It describes incorporating consideration of connectivity for grizzly bear at a site-specific scale, and follow direction of the FWS regarding management, project level analysis and consultation for grizzly bear on projects in order to reduce human-bear conflict and reduce impacts to current bear secure habitat.

Potential management approaches are considered optional plan content and are not required to be followed the same as plan components. Potential management approaches can be altered administratively without amending the Forest Plan. However, potential management approaches do reflect agency intent and provides guidance to practitioners on how to implement the plan. Potential Management approaches are also useful for clarifying the intent of plan components. They also provide insights into what was intended with the language within the plan components. In the case of grizzly bears, the potential management approaches take an adaptive approach. The potential management approaches section of the plan also describes management of vegetation, management of elk habitat and other guidance.

Cumulative Effects

This section discusses the effects of management on federal, state, and private lands within the analysis area. Cumulative effects are the effects of past, present, and future state, tribal, local, or private actions that have occurred, are occurring, or are reasonably certain to occur in the action area. The existing condition reflects the sum of past actions. The analysis of cumulative effects provides a larger context in which to evaluate existing conditions and the effects of the Forest Plan. This section discusses the effects of management on adjoining state and private lands, the potential for connectivity for species.

Land management plans for state and private lands within and adjacent to the Nez Perce National Forest boundary could have cumulative effects with proposed direction for the Nez Perce National Forest. Montana, Idaho, and Wyoming have incorporated regulatory mechanisms for consistency with demographic criteria in the Grizzly Bear Recovery Plan. Idaho does not have a management plan for grizzly bears in this area. Idaho works with the U.S. Fish and Wildlife Service to coordinate grizzly bear issues though the Interagency Grizzly Bear Subcommittee for the Bitterroot Ecosystem. It is reasonably certain that the subcommittee will continue grizzly bear recovery efforts through annual meetings, coordination with partners, development of education and outreach materials, and research and monitoring efforts. This will also include monitoring for the presence of grizzly bears including dna sampling to verify presence.

The Nez Perce-Clearwater National Forest cooperates as a member in the Bitterroot Ecosystem Subcommittee of the Interagency Grizzly Bear Committee in the management of grizzly bears. Included in this coordination is management of human-bear conflicts involving grizzly bears. Grizzly bear human conflicts can include livestock depredation, bears encountering attractants like human foods, defense of human life incidents, attacks on humans, conflicts with pets, accidental killings, and other actions that affect either human health, property, and bears. Actions taken by the various organizations that make up the committee include removing bears involved in conflicts, relocating bears away from conflict situations, euthanizing bears, providing warnings to forest visitors, placing signs, providing education, requiring food storage or other actions. Often actions result in the harm, harassment, or loss of grizzly bears. The incidents and resulting effects on grizzly bears are recorded and monitored for effects on grizzly bears.

The Montana Department of Fish, Wildlife, and Parks completed a grizzly bear management plan for western Montana in 2006 (Dood et al. 2006) and a grizzly bear management plan for southwestern Montana in 2013 (Montana Fish Wildlife and Parks 2013). Grizzly bear management plans establish goals and strategies to manage and enhance grizzly bear populations and to minimize the potential for grizzly bear-human conflicts. A long-term goal is to allow the populations in western and southwestern Montana to reconnect through intervening currently unoccupied habitats.

The Montana Department of Fish, Wildlife, and Parks is very active in providing public information and education about conserving grizzly bears and their habitat. Several bear management specialists, including one stationed nearby in Missoula, work with landowners and educate the public in order to avoid or resolve grizzly bear-human conflicts and to reduce grizzly bear mortalities. Bear specialists provide information and assistance to landowners on appropriate ways to secure food and bear attractants and respond to reports of conflicts with black bears and grizzly bears. These programs have a proven track record of success in informing the public, reducing the availability of attractants to bears on private and public lands, and reducing human-caused mortalities of grizzly bears. These programs and actions are also coordinated with the U.S. Fish and Wildlife Services bear management specialist.

Montana and Idaho regulate hunting for black bears and other wildlife species. Hunting of grizzly bears has not been allowed in Montana since 1991. There is a potential for grizzly bear mortality by hunters to occur as a result of mistaken bear identification or self-defense, especially in proximity to the carcasses of harvested animals. The Montana Department of Fish, Wildlife, and Parks provides a variety of public information and education programs, including a mandatory black bear hunter testing and certification program, to help educate hunters in distinguishing the two species. Black bear hunting seasons have been shortened in recent years, reducing the potential for mistaken identity. These efforts have helped to decrease legal and illegal shooting mortalities. No adverse cumulative effects are anticipated due to management actions of the Montana Department of Fish, Wildlife, and Parks.

Idaho’s strategy for grizzly bears, outlined in their Statewide Wildlife Action Plan, includes continuing conservation partnerships, reducing or preventing illegal and accidental mortalities, reducing anthropogenic attractants and other potential for human-bear conflicts, and managing access to limit conflict and disturbance. The Idaho Fish and Game allows liberal black bear hunting, including over bait. They engage the public in education about the difference between black and grizzly bears and notify the public about the potential to encounter a grizzly bear in the Clearwater region. The plan area contains inholdings of private lands in various places across the project area. Forestry management on state and private lands can affect grizzly bears by altering habitat and causing noise disturbance, but primarily through reductions in secure habitat associated with new road construction for accessing timber. Permanent developments to accommodate human population growth could occur on non-federal lands, with associated potential for adverse effects on grizzly bears and their habitats. Increasing development on private lands and the accompanying risk of human-grizzly bear conflicts has the potential to have cumulative adverse effects on grizzly bears that are moving towards the Bitterroot Ecosystem.

Developments within Northwestern Montana may pose a barrier to grizzly bear dispersal into the plan area.

The Forest cooperates as a member in the Bitterroot Ecosystem Subcommittee of the Interagency Grizzly Bear Committee in the management of grizzly bears. Included in this coordination is management of human-bear conflicts involving grizzly bears. Grizzly bear human conflicts can include livestock depredation, bears encountering attractants like human foods, defense of human life incidents, attacks on humans, conflicts with pets, accidental killings, and other actions that affect either human health, property, and bears. Actions taken by the various organizations that make up the committee include removing bears involved in conflicts, relocating bears away from conflict situations, euthanizing bears, providing warnings to forest visitors, placing signs, providing education, requiring food storage or other actions. Often actions result in the harm, harassment, or loss of grizzly bears. The incidents and resulting effects on grizzly bears are recorded and monitored for effects on grizzly bears.

The Nez Perce-Clearwater is flanked on the north by the St. Joe National Forest, the northeast by the Lolo National Forest, the east by the Bitterroot National Forest, and the south by the Payette National Forest. Management on these National Forests are unlikely to disrupt connectivity for grizzly bears. The Nature Conservancy mapped landscape permeability for the Pacific Northwest (McRae et al. 2016), including western Montana, by classifying areas as having high, moderate, or low landscape permeability. Overall, their analysis indicated that the network of federal lands in north central Idaho provides a high degree of landscape permeability for wildlife. Large federal land ownership (including Forest Service) and large blocks of wilderness within which human access is restricted by regulation and topography serve to reduce the impacts of human populations on grizzly bears and continue to provide habitat and connectivity for bears. A map showing the Nez Perce-Clearwater National Forests and other nearby National Forest Lands, along with designated wilderness areas are shown in figure 55. The Nez Perce-Clearwater National Forest is surrounded on all but one side by other National Forest Lands.

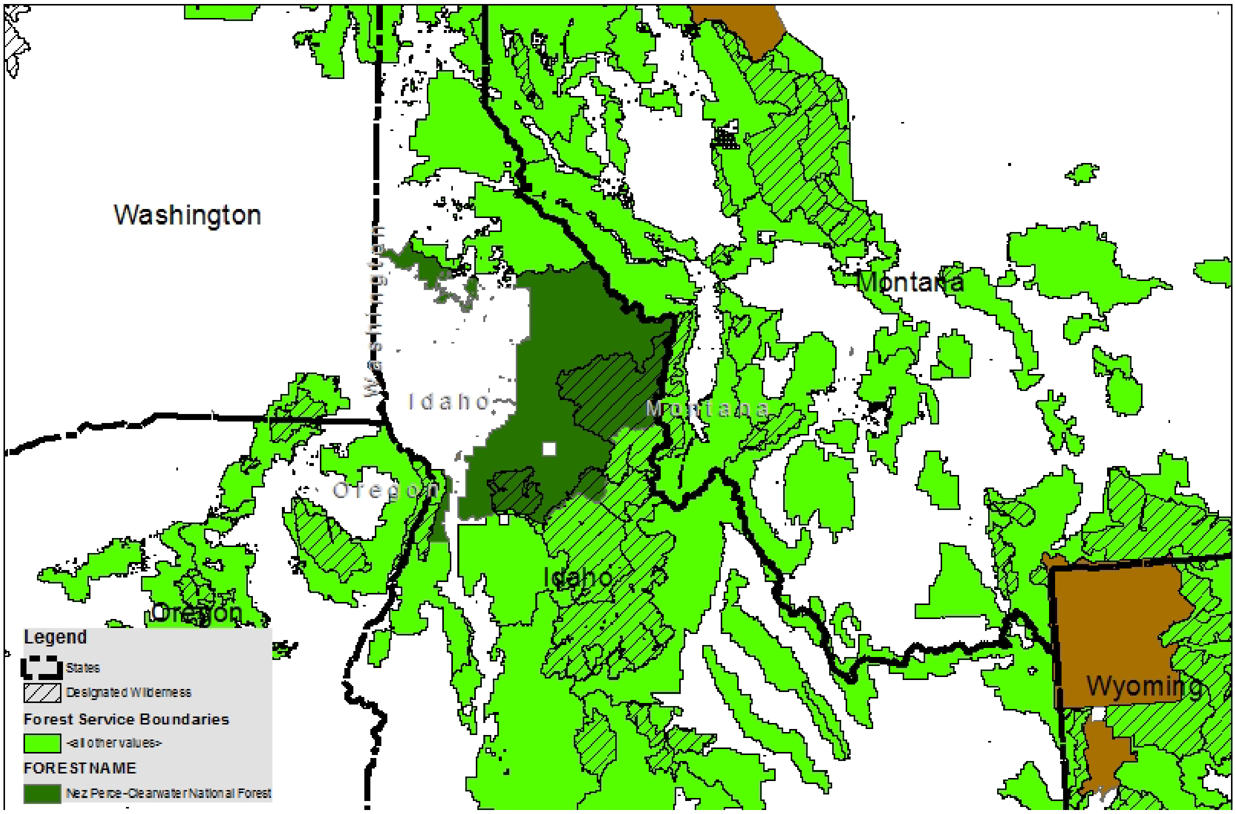


Figure 55. The Nez Perce-Clearwater National Forests, surrounding National Forest lands, Designated Wilderness areas and National Parks

The Idaho Department of Lands manages lands adjacent to the west of the Nez Perce-Clearwater. These lands are primarily managed for timber production and are heavily roaded. These lands mostly occur to the west of the plan area where grizzly bear dispersal is not expected to occur. In the event a grizzly bear enters these lands, the higher road densities and increased human activities may cause some bear-human conflict that could result in removal of dispersing bears.

The human population in northwest Montana has grown at a relatively high rate during the past few decades and growth is expected to continue. Increasing residential development and demand for recreational opportunities can result in habitat loss, habitat fragmentation, and increases in human-grizzly bear conflicts. There are several private inholdings within the administrative boundary including the checkerboard ownership near Lolo Pass. Private lands continue to account for a disproportionate number of conflicts and grizzly bear mortalities in Montana. These impacts are likely to intensify, although appropriate residential planning, outreach to landowners about how to avoid conflicts, tools such as bear-resistant containers and electric fencing, and assistance in resolving conflicts can help prevent or reduce these impacts. These areas are not under forest service authority.

In order for grizzly bears to reach the Nez Perce-Clearwater, they must pass one or more highways. Some of these highways have developments that may pose a challenge to the dispersal of grizzly bears into the Nez Perce-Clearwater (Servheen et al. 2003b). The combination of highways and developments poses significant barriers to grizzly bear dispersal into the Bitterroot Ecosystem. Servheen (2003b) predicted linkages that would allow dispersal. These linkages will be evaluated for effects to dispersing grizzly bears. Linkage areas are important for dispersal and connectivity between ecosystems.

As described in the baseline section above, any private entity's non-compliance with the Forest's access management is an illegal activity. Such illegal use is not considered a Forest (federal) action. These, and any other illegal activities are not the result of a federal action and therefore not analyzed under effects of the action, but their influence is considered for potential cumulative effects. Also described above, while cumulative effects to grizzly bears may occur as a result of illegal motorized access, the information as to the length, duration, amount of use, type of use, and location, among other conditions, is and will continue to be unknown until such time that illegal use is found. Illegal motorized access is expected to be spatially disparate and temporary and is not likely to collectively cause an adverse effect because most users follow travel regulations and when illegal use is observed or when user-created roads become apparent the Forest corrects the situation as soon as they are able.

Determination of Effects and Rational and Conclusion

Once grizzly bears establish a population, and perhaps as they move into the plan area, they will inevitably encounter existing conditions that could lead to conflict. The plan does not, nor could it, prohibit all actions that could lead to effects on grizzly bears, human-bear conflicts, and mortality as they move into the Forest. Some actions conducted under the plan or in the existing condition will increase the probability of human-bear conflicts that most likely will leads to either bear relocation or deaths after they become established. One of the most impactful factors for grizzly bear persistence across their range has been those that influence survival. Survival is most affected by human-bear conflicts that result from grizzly bear and human interactions and often result in bear deaths. Conflicts arise from bears being attracted to human foods, surprise encounters, livestock depredation, and recreation related contact. Many of these conflicts are correlated with the travel access system, and multiple studies have found that bear survival and habitat use is strongly related to motorized access. While the plan does not authorize motorized access, it sets the conditions and guidance under which motorized access would be governed. The proposed action relaxes restrictions on motorized access imposed by the 1987 forest plans. The proposed action does so in the following ways:

> 1) The proposed action changes the way that motorized uses are addressed compared to the 1987 plans. The proposed action does not include standards present in the 1987 plans that constrained or limited motorized roads and trails formerly imposed across most of the plan area in the form of Elk Habitat Effectiveness (EHE) standards. The outcome of these standards were a constraint that resulted in the various amounts of motorized travel routes currently present on the ground. The proposed action uses different mechanisms to provide for secure habitat. It relies first on constrains imposed by designations like the Idaho Roadless Rule and designated wilderness areas wherein laws prohibit roads with limited exceptions. Second it imposes restrictions via suitability plan components associated with land allocations to protect areas from motorized uses. Third, in Idaho Roadless Rule area suitable for motorized uses, the plan includes guideline FW-WL-GDL-05 which constrains motorized trails in Idaho Roadless Rule in order to maintain large areas of secure habitat. The mechanisms are not directly comparable, but these generally provide protections in many areas that previously imposed elk habitat effectiveness restrictions (compare figure 5, figure 38, figure 49 and figure 52). In some areas, the guidance in the proposed action are less restrictive than those in the 1987 plans. While the mechanisms are different, they will still be effective at maintaining secure habitat in areas important to connectivity. The most obvious changes are within management area 3, which had a 25% or 50% EHE requirement, will no longer have restrictions. Additionally, parts of the West Meadow Creek, the Rackliff-Gedney, Moose Mountain, and Bighorn-Weitas Idaho Roadless Rule Areas will have less protections as a result of the change as all or parts of them had 100% elk habitat effectiveness requirements in the 1987 plans but will be suitable for motorized uses in the proposed plan. The most relative importance of these from a connectivity standpoint are the Bighorn-Weitas, and Moose Mountain

Idaho Roadless Rule Areas. There would still be a mechanism to protect these areas but it would be less protective in those areas than in the 1987 plans. The plan establishes the changes in the Summer and Winter Recreation Opportunity Spectrum settings.

2) The proposed action reduces the number of river corridors that will be managed as eligible for inclusion into the Wild and Scenic River system. Instead, the plan identifies fewer rivers that are suitable as wild and scenic rivers after an in depth wild and scenic river evaluation. Because the number of rivers are fewer, less area (river corridors) would be managed with the protections that wild and scenic river management provides. While most of those rivers are within wilderness and already well protected, some limited amounts of river corridors are outside of wilderness areas and will receive the protections afforded to them by the Aquatic and Riparian plan components but not the additional layer of protections that Wild and Scenic River eligibility would afford them. These include six river corridors located within Idaho Roadless Rule areas, or within MA3 managed for multiple uses. These rivers would no longer be required to be managed for their outstandingly remarkable values during project work. Free-flow would be maintained only through the aquatic and riparian plan components but not also by the eligible river plan components which add an additional layer of protection.

3) The plan increases the maximum size of openings created by timber harvest before Regional Forester approval is required. The maximum size able to be conducted before regional forester approval goes from 40 acres in the 1987 plans to 207 acres in the proposed plan. In both plans, larger openings were able to be conducted with Regional Forester approval. Under natural disturbances, larger openings of regenerating forest were common, and the change will allow the forest to managed more towards a patch distribution and pattern more consistent with the natural range of variation for opening size that resulted from natural disturbances. Nevertheless, the change will allow more acres and larger sizes to be conducted in a single operation.

4) While the total amount of recommend wilderness is more in the proposed plan compared to the 1987 plans, the boundaries of some recommended wilderness areas would change, and be less protected in those areas. Notable changes include the Hoodoo, Sneakfoot meadows, and Spruces White Sands recommended wilderness areas, some of which could be important for connectivity.

5) The proposed plan would encourage more vegetation management including additional timber harvest above levels currently conducted under the 1987 plans. Current amounts to approximately 50-60 million board feet per year while the proposed action would establish a range of acres as objectives between produce between 190-210 million board feet annually. Furthermore, the total amount of disturbance including timber harvest, fuels treatments and wildland fire go from 40,000 acres to between 53,000 to 64,500 acres in the proposed plan. Wildland fire includes both prescribed fire and wildfire that achieves land management plan objectives.

6) The plan includes plan components that encourage maintaining or increasing multiple uses and ecosystem services. Some of these plan components would result in more development while others would potentially result in a redistribution of motorized access. Of note are plan components in the Minerals and Energy, Recreation, and Ecosystem services sections.

Therefore, the Revised Forest Plan under the Proposed Action **May affect and is Likely to Adversely Affect** grizzly bears that may currently be present or that may disperse into the plan area in the future.

The forest plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out a project or activity (including ground-disturbing actions). As a result, it does not result in direct effects to wildlife. Each project conducted under the Forest plan constitutes a federal action that must undergo site specific environmental analysis and Endangered Species Act consultation before actions take place. Additional consultation occurs prior to when site-specific projects are implemented under the programmatic framework provided by the national forest plans. The forest plan provides the framework and text guiding day-to-day resource management. It is strategic and programmatic and does not provide project-level decisions or result in irreversible or irretrievable commitments of resources. Specific concerns related to effects to grizzly bears from projects will be addressed at the project-specific consultation level. Specific future actions to address grizzly bears conservation at the project level is an adaptive management approach outlined in the Potential Management Approaches section. This plan does not carry out specific projects on the ground and those specific concerns will likely be addressed at the project-specific consultation level which will also include consideration of the current status of bears within the action area.

The indicator used to evaluate the effects of the plan on ecological conditions for grizzly bears and connectivity was secure habitat, which is habitat outside of 0.31 miles (or 500 m) of open motorized roads and trails. Secure habitat is important to survival, grizzly bear demographics, and mortality risk factors. It is an appropriate indicator to evaluate the effects of the Revised Forest Plan on ecological conditions for grizzly bears. The analysis evaluated how land allocations and their associated suitability of uses have the potential to maintain secure habitat.

The first key question in the analysis was whether the plan would provide the ecological conditions for grizzly bear recovery within the Bitterroot Recovery Zone. The analysis found that because these areas are designated wilderness, they will provide for recovery because wilderness management constrains nearly all activities that lead to loss of secure habitat and human-bear conflicts, with the exception of human attractants. In these areas, secure habitats can only be influenced by motorized routes developed outside of the wilderness area boundaries. These wilderness areas make up the majority of the Bitterroot Recovery Zone and establishes strong and permanent measures that will protect grizzly bears and their habitat from impacts, and which allow establishment of a population expected to trend towards recovery. The plan does not contain species specific measures for grizzly bears within the Recovery Zone as these are simply not needed because suitability plan components and wilderness restrictions will maintain ecological conditions to contribute to recovery. This area alone provides the ecological conditions to provide for recovery provided they can disperse into the recovery zone.

The second key question was whether the rest of the plan area, outside the recovery zone, provides the ecological conditions to support connectivity and even provide for grizzly bears living outside of the recovery zone. The ability of grizzly bears to move into and establish populations into the Bitterroot Recovery Zone is an important consideration into how the plan provides for grizzly bear recovery. The analysis found that the existing condition is such that grizzly bears could travel through and even establish populations outside of the recovery zone. Furthermore, the plan establishes a suite of land management allocations and associated suitability plan components that collectively and individually direct management that restrict or constrain actions that could reduce secure habitat. On top of that, the plan also establishes desired conditions, objectives, goals and standards and guidelines, including species specific grizzly bear components that also contribute to ecological conditions to provide for connectivity and recovery.

These measures meet the requirements of the 2012 Planning Rule to provide the ecological conditions to contribute to recovery. These measures are also sufficient to provide the ecological conditions within the Bitterroot Recovery Zone for the achievement of recovery goals as outlined in the 1993 Grizzly Bear Recovery plan including the Bitterroot Ecosystem Chapter of the Recovery Plan (1996). While the wilderness areas will provide the primary ecological conditions for recovery, grizzly bears must somehow populate the recovery zone, either through natural dispersal or through translocation. Naturally, female grizzly bears would need to become established and reproduce to grow the population and progress towards recovery. Thus, one of the primary questions of this analysis was whether the plan would provide the ecological conditions and connectivity to provide for grizzly bears, and in particular females, to disperse into the Bitterroot Recovery Area from other grizzly bear ecosystems. The key factor is whether the plan would maintain secure habitat to provide connectivity from the Northern Continental Divide, Cabinet-Yaak, or Selkirk Ecosystems into the Bitterroot Recovery Zone. Bears would most likely pass through the northern portion of the Nez Perce-Clearwater to enter this ecosystem, though it's possible that bears from the Greater Yellowstone Ecosystem could one day enter from the South into the Bitterroot Recovery Zone. The current condition is that the Forest currently has large and connected secure habitats to provide connectivity and the land allocations along with their associated restrictions imposed by suitability plan components would continue to maintain many areas to provide the ecological conditions to provide connectivity. The plan's management area allocation collectivity help to ensure these areas are maintained.

The effects of the plan must be viewed as an integrated whole rather than focusing on individual plan components because it is the integrated and interacting parts of the plan that provide the overall guidance for forest management. The plan does not have many species-specific plan components for grizzly bears because of the direction in the 2012 Planning Rule to provide the ecosystem integrity and coarse filter ecosystem plan components to provide the ecological conditions for recovery. In whole, the plan provides a variety of plan desired conditions, guidelines, standards and suitability of uses that indirectly benefit grizzly bears. Examples include plan components noted in the "Plan Direction that Contributes to Grizzly Bear Recover" section above.

The analysis concludes that the plan establishes a combination of land management allocations and their associated suitability plan components that will serve to maintain secure habitats outside the recovery zone to provide for connectivity. These land allocations include Recommended Wilderness, Idaho Roadless Rule Areas, Designated Wild and Scenic Rivers, Suitable Wild and Scenic Rivers, the National Historic Landmark, and Summer and Winter Recreation Opportunity Spectrum settings. Suitability plan components impose restrictions on a wide variety of uses including motorized use where vast areas are not suitable for motorized development and thus are forbidden. Some Roadless Rule Areas are suitable for motorized uses but have plan guidelines that constrain the amount of motorized routes such that connectivity would be maintained. While some actions could reduce secure habitat in these areas, overall, plan direction will still maintain these areas for connectivity. These land allocations and their associated suitability plan components were in part explicitly identified and selected from alternatives to contribute to grizzly bear connectivity among other considerations. They are nested under the 3 Management Area framework of the plan though each type of land imposes different levels of protection via suitability plan components. They each also contain desired conditions that will guide the prevailing management of these lands. In this way, the plan establishes areas for grizzly bear dispersal, occupation of the recovery zone, and even occupation outside the recovery zone through these allocations, but also excludes uses through suitability plan components within those lands that will largely maintain secure habitat. Collectively, they combine to establish restrictive management throughout the majority of the Planning Area and constrain a variety of potentially impactful activities as detailed above. Suitability plan components associated with land allocations are consistent with and reinforced by existing laws and regulations that govern the use of these lands, such as wilderness designation, wild and scenic river designation, and Idaho Roadless Rule Areas designation. Actions will not be allowed under the plan in those areas when not suitable. Thus, the plan establishes mechanisms to provide ecological conditions that contribute to grizzly bear recovery and connectivity both within and outside the recovery zone. The Nez Perce-Clearwater National Forests are huge, and the majority of it are managed under restricted land uses as described above. This would allow female grizzly bears to pass through the forest and enter the Bitterroot Recovery Zone to grow a population towards recovery goals.

The plan establishes three species specific desired conditions and a species-specific guideline for grizzly bears that will guide management of all future projects under the plan. These include FW-DC-WL-06, FW-DC-WL-07, FW-DC-WL-08, and MA2-GDL-WL-01. Additional plan desired conditions would guide the Forest to provide for connectivity in for FW-DC-WL-09 for species like grizzly bears and others. Additionally, as shown in the Plan components that contribute to ecological conditions for grizzly bears section, many other coarse filter ecosystem plan components also contribute to ecological conditions for grizzly bear dispersal and occupancy. Collectively, all these aspects of the plan combine to establish measures that will continue to maintain ecological conditions for grizzly bears to disperse into the Bitterroot Recovery Zone and establish a grizzly bear population.

The land allocation and suitability decisions were also responsive to the key NEPA issue statements regarding motorized access wherein many commenters desired more motorized access. Thus, plan allows new areas to be suitable for motorized access while at the same time constraining those activities with guideline MA2-WL-GDL-05 to maintain ecological conditions within Idaho Roadless Rule Areas suitable for motorized uses. Some forest plan direction could allow reduction of some secure habitat over time. While the combination of Idaho Roadless Rule Areas, areas identified in non-motorized Summer Recreation opportunity spectrum settings, recommended wilderness, and designated wilderness all establish mechanisms that provide for low road densities and high amounts of secure habitat, there are some exceptions to these protections. Specifically, the development of additional motorized trails within Idaho Roadless Rule areas would be a suitable use in in areas identified as suitable for motorized uses and could experience increased motorized trails. The Idaho Roadless Rule does not restrict motorized trails and additional motorized trails are desired by the public. However, mechanisms are in place to constrain those activities in order to maintain secure habitats thus providing ecological conditions for connectivity. Specifically, plan direction for elk under guideline MA2-GDL-WL-05 would constrain the amount of motorized trails both in location and in extent within Roadless Rule Areas but are limited only to those areas suitable for motorized uses. There are also areas within the plan, including within Idaho Roadless Rule Areas, that were identified as non-motorized to provide connectivity for wildlife including grizzly bears (figure 49). No motorized uses would be suitable within these non-motorized settings which include primitive and semi-primitive non-motorized settings.

The plan includes a potential management approaches section specific to grizzly bear management and which takes an adaptive approach to manage grizzly bears as they move into the area. While these are optional plan content and are not required to be followed the same as plan components, provide agency intent on management of grizzly bears in the future as bears move into the area. Topics include participation by the Nez Perce-Clearwater National Forest as a member of the Bitterroot Ecosystem subcommittee in order to understand best available science and best practices regarding grizzly bears in the Bitterroot Ecosystem and support recovery in the Bitterroot Recovery Zone. Potential management approaches also describe the use of minimization measures and conservation recommendations by the Bitterroot Ecosystem Subcommittee including sanitation plans, infrastructure and reducing attractants. It describes incorporating consideration of connectivity for grizzly bear at a site-specific scale, and follow direction of the FWS regarding management, project level analysis and consultation for grizzly bear on projects to reduce human-bear conflict and reduce impacts to current bear secure habitat.

Much of the plan area outside of the Bitterroot Recovery Zone, excluding Management Area 3, also could currently contribute to grizzly bear recovery because they appear to have the sufficient secure habitat for female dispersal and reproduction to allow grizzly bears to spread into the Bitterroot Recovery Zone. Grizzly bears are most likely to enter the forest from the north or northeast from potentially three other grizzly bear ecosystems. Based on female dispersal patterns, female dispersal will most likely require females living on the Nez Perce-Clearwater outside of the Recovery Zone perhaps for several generations before they reach the Bitterroot Recovery Zone. The plan area currently has these ecological conditions because it has approximately 2,463,079 acres of secure habitat which would allow survival, reproduction, and connectivity. These conditions compare favorably to some other grizzly bear ecosystems such as the Cabinet Yak, and Selkirk Ecosystems. The amount of secure habitat is more than the whole of Yellowstone National Park which is 2,221,766 acres. These conditions are the result of a combination of 1,483,636 acres of Idaho Roadless Rule area, 1,139,059 acres of designated wilderness, and 191,281 acres of recommended wilderness management, which all constrained travel access. Designated wilderness and Idaho Roadless Rule areas are established by law and will not change under the plan.

Various direction in the revised forest plan has the potential to affect grizzly bears. Many areas of the plan have direction that would be beneficial to grizzly bear habitats. Other direction has the potential to adversely affects grizzly bears through future actions implemented under the plan including direction in Forestlands related to timber, energy and minerals, sustainable recreation, ecosystem services, and timber suitability. The potential for effects stem from suitability determinations for timber production, motorized uses, livestock grazing, minerals, and motorized trails. Many of these activities are constrained in management areas 1 and 2 because they are identified as unsuitable or conditionally suitable.

The most impactful factor influencing the future potential maintenance of secure habitat is the suitability of motorized access meant to strike a balance of ecological conditions with social and economic considerations. Access was one of the issue statements for the development of the plan. The most impactful potential change is in the summer recreation opportunity spectrum, which dictates suitability for motorized uses and the level of development of recreation settings. In terms of grizzly bear conservation, the existing condition provides about 85 percent of habitat not suitable for motorized use, and robust mechanisms to protect secure habitat because of measures for elk security. The Proposed action reduces the area not suitable for motorized access down from 55.3 percent down to 45.1 percent of the planning area or in other words increases the area suitable for motorized use by about 417,696 acres with the intent to increase motorized access around and between local communities for social and economic purposes. While about 45.1 percent of the Forest would not be suitable for motorized uses, a total of 69 percent of the secure habitats within the plan area would not be suitable for motorized uses.

Most of the increase in motorized routes would occur within Management Area 3, but motorized access through the construction of motorized trials would occur within Management Area 2, mostly within Backcountry Restoration theme Idaho Roadless Rule Areas. A total potential amount of 31 percent of the secure habitat could be affected by some sort of reduction due to motorized uses but the location of where, when, and how much is unknown. Furthermore, they would undergo site specific analysis and consultation before being authorized. New motorized roads or trails could potentially result in loss of secure habitat. Losses would only occur outside the Recovery Zone because motorized trails are not suitable in designated wilderness, nor recommended wilderness. Not every area that is suitable for motorized uses will have a motorized trails developed there, and all new motorized trail would undergo their own site-specific analysis and consultation.

Even with increased areas suitable for motorized uses, the plan area would follow Idaho Roadless Rule theme restrictions that would restrict roads, maintain roadless character, and would manage designated and recommended wilderness to maintain wilderness character. Since roads are prohibited, the key consideration would be the future creation and use of motorized trails within Management Area 2, which is mostly composed of Idaho Roadless Rule areas. In these cases, species specific plan direction limits motorized trails in that management area so that they would have to maintain areas so that when areas 10,000 acres or larger have a motorized trail constructed, there must remain areas 5000 acres or larger without motorized access on either side of the new trail. Areas between 10,000 and 5,000 acres would be protected, while secure habitats smaller than 5,000 acres would not be protected. This plan component would restrict where and how much new motorized access there could be in Management Area 2 and still maintain many areas as secure habitats because most of the secure habitats in Idaho Roadless Rule Areas are larger than 10,000 acres and could only be divided a limited number of times. Thus, the plan area would continue to provide the ecological conditions for connectivity into the Bitterroot Recovery Zone.

The plan will establish recommended wilderness, which would enhance connectivity for grizzly bears more than Idaho Roadless Rule area management. Under the proposed action the amount of recommended wilderness increases to 258,210 from 191,281 acres. The proposed Mallard-Larkin, and Hoodoo recommended wilderness areas would provide benefits to connectivity for dispersing bears to enter into the Bitterroot Recovery Zone. The Meadow Creek Recommended Wilderness Area would improve conditions adjacent to the Bitterroot Recovery Zone. The Proposed action increased the amount of recommended wilderness areas in the plan area. They will provide protections against activities that reduce secure habitat in those areas.

Suitable wild and scenic rivers would provide some limited connectivity for bears because they would provide linear corridors for travel in various amounts that could be followed by dispersing bears. They also provide limited protections against road construction.

Recreational activities and developments have the potential for bear-human conflicts. The plan does not authorize any new facilities but there will be a future need to expand recreation facilities to accommodate uses. It can be expected that there will be an increase in trails, dispersed sites, developed sites, mechanized uses and special uses that could increase the probability of human bear conflict and result in bear removal or death. The plan does not have any direction to restrict attractants associated with people though it does have plan components to prevent bear human conflicts though education and direction to equip existing facilities with food storage infrastructure. Food storage orders would be authorized in the future as appropriate as grizzly bears move in and would occur through a special forest order.

Cumulative effects outside of Forest Service control may make it difficult for bears to enter into the Nez Perce-Clearwater and the Bitterroot Ecosystem from the other ecosystems to the north of the Nez Perce-Clearwater. The most significant barrier is highways, such as I-90, Montana Highway 200, and Montana Highway 93, and the associated human development around these highways that pose the most significant challenges for dispersing grizzly bears to make it into the Bitterroot Ecosystem. Within the Forest, Highway 12 could slow dispersal to some extent, but this highway has comparatively low traffic volume to other highways mentioned above. Within the boundaries of the Forest, the checkerboard ownership area near Lolo pass has higher road densities that would be slightly less permeable than the surrounding forest. These are factors are outside of Forest Service Authority. Based upon the linkage areas identified in Servheen and others (2003b), the most likely places for bears to enter the Nez Perce-Clearwater are between the Mallard-Larkin area and the Hoodoo area. Once bears cross the highways and associated development in and around Missoula, Montana, they should be able to be connected to the Bitterroot Ecosystem.

The plan includes a Potential Management Approaches section for grizzly bears and provides agency intent of actions to implement as grizzly bears become established in an adaptive framework.

The Nez Perce-Clearwater National Forests participates in the Bitterroot Ecosystem Subcommittee, and, and will continue to coordinate recovery efforts within that group. The Forest also engages with other government and collaborative groups such as the Idaho Department of Fish and Game, the Nez Perce Tribe, and the Clearwater Basin Collaborative. The Forest will continue to include their guidance as bears may begin to establish a population in the action area.

Wolverine

Introduction

This section of the BA analyzes the potential effects of the proposed federal action on the North American wolverine, a species proposed for Endangered Species Act Listing. Under the provisions of the ESA, Federal agencies shall use their authority to carry out programs for the conservation of listed species, and shall ensure that any action authorized, funded, or implemented by the agency is not likely to jeopardize the continued existence of proposed species (16 USC 1536). Analysis of effects on a proposed species is limited to whether the project jeopardizes the species; analysis of effects on individuals is not required. Additionally, the 2012 Planning Rule requires plans to provide the ecological conditions to conserve proposed and candidate species. This analysis evaluates the effects of the revised forest plan on the North American wolverine (*Gulo gulo*) within the Nez Perce-Clearwater National Forests. The area used to analyze direct, indirect, and cumulative effects for wolverine is the lands administered and controlled by the Nez Perce-Clearwater National Forests. The North American wolverine has a history of occupancy within the Nez Perce-Clearwater National Forests. This analysis evaluate how the revised forest plan under the Proposed Action would affect the wolverine and provide the ecological conditions for the wolverine. The analysis below evaluates how the plan components and land allocations in the Forest plan (proposed action) would affect wolverines and whether the outcomes expected by following the forest plan direction would provide the ecological conditions to conserve wolverines. Furthermore, this document evaluates whether the guidance provided by the proposed action would result in an outcome that would jeopardize the continued existence of the wolverine.

The 2012 Planning Rule requires forest plans to include plan components that provide the ecological conditions necessary to conserve proposed and candidate species. Key ecosystem characteristics for the wolverine, a proposed species, include high elevations with persistent spring snow, habitat for dispersal, and features, such as rocky alpine areas, glacial cirque basins, and avalanche chutes, that provide food sources, such as marmots, voles, and ungulate carrion. Maternal and natal denning habitat with relatively low levels of human development are important, although the thresholds are unknown.

The Nez Perce-Clearwater does not anticipate substantial changes to wolverine maternal or natal denning habitat over the anticipated life of the plan but, if conditions change in the future, or if research or monitoring indicates there is a need to address specific threats that are within Forest Service authority or capability to manage, the land management plan may be amended or revised in the future if necessary.

Status

The North American wolverine was proposed to be listed as a threatened species under the Endangered Species Act (ESA) by the U.S. Fish and Wildlife Service (FWS) in February 2013 (U.S. Department of the Interior 2013d). The following year the FWS withdrew their proposed rule (U.S. Department of the Interior 2014c). The District Court for the District of Montana subsequently vacated the 2014 withdrawal of the proposed rule in 2016 after legal challenges were filed against the agency. The FWS responded by reopening the comment period on the 2013 proposed rule and initiated a new status review of the species (U.S. Department of the Interior 2016). This included completion of a Species Status Assessment (SSA) to help inform their decision-making process (U.S. Department of the Interior 2018b). In October 2020, the agency withdrew their 2013 proposed rule to list wolverine as threatened (U.S. Department of the Interior 2020b). Additional litigation followed, and the FWS requested a voluntary remand of their decision in the spring of 2022. On May 26, 2020, the District Court for the District of Montana vacated the 2020 withdrawal of the proposed rule and wolverine was once more considered “proposed” under the ESA which is its current status.

The State of Idaho identifies wolverines as a tier 1 species of greatest conservation need in their statewide wildlife action plan (Idaho Department of Fish and Game 2017). The Idaho Fish and Game established a statewide plan for wolverines. In that plan they identify wolverine priority conservation areas as a framework for managing wolverines in the State of Idaho. The areas across the state with wolverine habitat were categorized as Tier I, Tier II, or Tier III as a means to prioritize conservation work for wolverines. Nearly all the lands of the Nez Perce-Clearwater were identified as either Tier II or Tier III (moderate to low).

Habitat requirements, Distribution and Population levels and Life history

Wolverines live at low densities and occupy remote areas with persistent snowpack, which they use for denning. Their global distribution is circumpolar, as they occupy the boreal regions on several continents. They rely on small mammals and ungulates as food sources, both scavenging and hunting their prey. Winter food resources influence habitat selection (Krebs et al. 2007) and survival (Krebs et al. 2004).

The FWS (2018b) Species Status Assessment for the North American wolverine concluded that the wolverine's physical and ecological needs include:

1) large territories in relatively inaccessible landscapes; at high elevation (1,800 to 3,500 meters (5,906 to 11,483 feet))

2) (2) access to a variety of food resources, that varies with seasons; and

3) (3) physical/structural features (e.g., talus slopes, rugged terrain) linked to reproductive behavioral patterns.

The analysis will consider these ecological needs in the context of how land allocations and plan components would affect the North American Wolverine and address threats and stressors (U.S. Department of the Interior 2017c).

Krebs et al. (2007) modeled male versus female wolverine habitat selection in British Columbia, hypothesizing that food, predation risk, and human disturbance affected habitat selection. Krebs et al. (2007) based their model on 39 adult wolverines, 23 females and 16 males, that were located a total of 2,125 times within two study areas. These authors modeled selection in two time periods: winter and non-winter. The winter season was defined as the period when there was persistent snow cover at the treeline. Human use variables incorporated into the models included those associated with winter recreation activity, roads, and timber harvesting. Winter recreation data included estimates of snowmobile primary use sites, locations of runs for two helicopter skiing companies in the Columbia Mountains study area, and backcountry ski use centered on the Trans-Canada Highway corridor within and adjacent to Mount Revelstoke and Glacier National Park. These authors stated that extensive timber harvesting had occurred within a large portion of the study area. Krebs et al. (2007) concluded that male wolverines were most closely associated with food availability in both summer and winter. Moose winter ranges, valley bottom forests, and avalanche terrain were positively associated with winter male wolverine use.

Krebs et al. (2007) stated:

> *"Habitat associations of females were more complex; combinations of variables supporting food, predation risk, or human disturbance hypotheses were included in most supported models from both summer and winter in both study areas. Females were associated with alpine and avalanche environments where hoary marmot and Columbia ground squirrel prey are found in summer. Roaded and recently logged areas were negatively associated with female wolverines in summer. In the Columbia Mountains, where winter recreation was widespread, females were negatively*

associated with helicopter and backcountry skiing. Moose winter ranges within rugged landscapes were positively associated with females during winter. Our analysis suggests wolverines were negatively responding to human disturbance within occupied habitat. The population consequences of these functional habitat relationships will require additional focused research. Our spatially explicit models can be used to support conservation planning for resource extraction and tourism industries operating in landscapes occupied by wolverines."

Magoun and Copeland (1998) described two types of reproductive dens: natal dens where young are born and maternal dens where the mother may move the kits if conditions are no longer suitable at the natal den. Sites used for maternal dens are often close to the natal den and have a similar structure. Prior to the Glacier National Park study, not much was known about the den sites of reproductive female wolverines in Montana because den sites are often in remote terrain that is very difficult to study. During the first three years of the study, data was collected for 19 wolverines and information about reproductive dens was obtained for two adult females that raised four offspring (kits). Copeland et al. (2010) found that dens were excavated in the snow and were on upper slopes in sparse timber beneath downed woody debris or rocks. Dens are typically used through late April or early May. Females used two to three different dens prior to the weaning of kits at six to seven months of age. Kits gather at rendezvous sites that are primarily in boulder, talus, and cliff areas (Copeland et al. 2010). Survival of young was low, even in the National Park setting where trapping was not allowed, and motorized disturbance did not occur in winter or spring. Wolverine den sites may not occur in the same exact spot year after year and specific maternal and/or natal den sites on the Nez Perce-Clearwater are unknown. Today there is no trapping of wolverines allowed anywhere in the lower 48 U.S. states.

Snow in wolverine habitat may be affected by changes in climate. For this BA, the Nez Perce-Clearwater used a compilation of climate change effects published for the Northern Region Adaptation Partnership (Halofsky et al. 2018b;c) that summarizes climate change projections by subregions. Downscaled climate models were used to predict the effects of a changing climate. Future climate uncertainty and anticipated variability is associated with scale. Potential effects of future changes in snow cover and persistence are uncertain or variable due to geographic location, atmospheric circulation patterns, such as the Pacific Decadal Oscillation, and elevation.

Some researchers have proposed a hypothesis that wolverines require persistent snow, and that the distribution of persistent snow explains the majority of wolverine distribution (Copeland et al. 2010). For wolverine habitat across the western United States, Inman et al. (2013) reported that, in general, wolverines are distributed in areas of higher elevation where there is steeper terrain, more snow, fewer roads, and less human activity and in areas closer to high-elevation talus, tree cover, and snow cover persisting to April 1. Year-round habitat includes rocky alpine habitats, glacial cirque basins, and avalanche chutes that provide food sources, such as marmots, voles, and carrion (Hornocker and Hash 1981, Magoun and Copeland 1998, Copeland et al. 2007, Inman et al. 2007). Wolverines appear to rely on the cold and snow to cache carrion (Inman et al. 2012a). Wolverines also travel through the area where snow persists, and they minimize travel through low-elevation habitat (McKelvey et al. 2011). Persistent spring snow cover is also correlated with gene flow because this is where the wolverine's within-home-range movements and dispersal occur year-round (Schwartz et al. 2009).

Aronsson and Persson (2017) and Jokinen et al (2019) demonstrated wolverine denning in areas without persistent snow, questioning the absolute necessity of persistent springtime snow for wolverine denning success. Aronsson and Persson (2016) showed that the wolverine population in Sweden has expanded considerably into the boreal forest landscape, and colonized areas without persistent spring snow cover. Similarly Jokinen et al (2019) documented female Wolverines appear to be using locally-available denning structures in the lowland boreal forest, despite a lack of deep snow, persistent spring snow cover, or large boulders documented in other studies. A study by Webb et al. (2016) found that wolverines in the boreal forest region of northern Alberta were not as closely associated with persistent spring snow as wolverines in the Rocky Mountains and suggested that these two very different habitats should be separated for analysis purposes and for the study of climate change effects.

Primary wolverine habitat is also characterized by low levels of human development (Hornocker and Hash 1981, Copeland 1996, Krebs et al. 2007). This negative association with frequent human presence is sometimes interpreted as active avoidance of human disturbance but it may reflect the wolverine's preference for cold, snowy, and high-elevation habitat that humans do not often develop.

Winter backcountry recreation opportunities in the northern Rocky Mountains include snowshoeing, snowboarding, skiing, heli-skiing, snowcat- or trackster-assisted skiing and snowboarding, snow bikes, and snowmobiling. Studies of winter recreation have produced mixed conclusions. Wolverines have been documented to persist and reproduce in habitats with high levels of human use and disturbance, including developed alpine ski areas and areas with motorized snowmobile use (Heinemeyer 2012, Heinemeyer and Squires 2013). Heinemeyer and Squires (2014) stated: "wolverines appear to tolerate winter recreation in their home ranges, including denning females. Based on our preliminary findings, potential wolverine habitats that have even high levels of winter recreation may support resident wolverines despite the potential human disturbance." This suggests that wolverines can survive and reproduce in areas that experience human use and disturbance; however, there is uncertainty with respect to the amount, type, and timing of human recreational use and its effects on female wolverines.

Heinemeyer et al. (2017) studied effects of winter recreation on wolverines in the Greater Yellowstone Area. They found that wolverines responded to backcountry winter use in different ways but, given the extent of overlap between winter recreation and wolverine distribution, suggested that wolverines tolerate winter recreation to some degree. In this study, wolverines reacted negatively to higher levels of recreation use in winter, with stronger responses to dispersed use than to use on designated routes, indicating that wolverines may have a higher tolerance for more predictable patterns of winter recreation use. Wolverines reacted to both motorized and nonmotorized winter recreation. However, since motorized equipment allows humans to travel further and faster than nonmotorized means of transport, motorized winter recreation could affect larger proportions of wolverine habitat.

Heinemeyer et al. (2019) suggested stronger negative responses to winter recreation than previous publications suggested. They fit GPS collars on wolverines to monitor responses to winter recreation and other resources in mid- and late-winter (January through March) and concurrently sampled the spatial patterns of winter recreationists with three methods: GPS tracking of volunteer recreationists, infra-red trail use counters, and aerial surveys. Datasets were obtained from Idaho, Wyoming, and Montana, spanning more than 1.1 million acres; however, the Nez Perce-Clearwater area was not included. From the data, they developed resource selection functions for wolverines with a use: availability design to estimate the relative probability of selection, assess the effect of winter recreation on wolverine habitat selection, and evaluate indirect habitat loss from winter recreation. They also tested whether wolverines showed functional responses to winter recreation based on the relative intensity of winter recreation to which they were exposed. Winter recreation activities varied in the number of recreationists and types of recreation, and each study area had a unique combination of backcountry recreation, including snowmobiling; skiing, including snowboards; snowmobile-accessed skiing and boarding (hybrid); cat-skiing; heli-skiing; and yurt-supported skiing. They obtained collar data from 24 wolverines that were tracked between 1 to 4 years and obtained 53,301 locations used in the spatial modeling and 6603 for model validation. They concurrently obtained 5899 GPS tracks from a variety of winter recreation uses and obtained trail use estimates from 25 trail use counters to obtain recreation intensity.

Heinemeyer et al. (2019) found that wolverine avoided areas of both motorized and non-motorized winter recreation and demonstrated that off-road recreation (backcountry skiing, snowmobiling) elicited a stronger response than road-based recreation, with female wolverines exhibiting stronger avoidance of off-road motorized recreation than male wolverines. Motorized recreation occurred at higher intensity across a larger footprint than non-motorized recreation in most wolverine home ranges. Wolverines avoided areas of both motorized and non-motorized winter recreation with off-road recreation, eliciting a stronger response than road-based recreation. Female wolverines exhibited a stronger avoidance of off-road motorized recreation and experienced higher indirect habitat loss than male wolverines. Wolverines showed negative functional responses to the level of recreation exposure within the home range, with female wolverines showing the strongest functional response to motorized winter recreation. Wolverines maintained multi-year home ranges within landscapes that support winter recreation and some resident animals had greater than 40 percent of their home range within the footprint of winter recreation. This suggests that wolverines tolerate winter recreation at some scale. However, within home ranges, wolverines avoided all forms of winter recreation and showed increasing avoidance of areas as the amount of off-road winter recreation increased, resulting in indirect habitat loss or degradation of moderate- or high-quality habitats. This study suggests indirect habitat loss, particularly to females, could be of concern in areas with higher recreation levels. Potential for backcountry winter recreation to affect wolverines may increase under climate change if the reduced snowpack concentrates winter recreationists and wolverines in the remaining areas of persistent snow cover.

Kortello (2019) tested hypotheses that explored a number of factors that explain the distribution of wolverines at different scales in Southern British Columbia just north of the Idaho-Canadian border. They tested four factors: climate, food, human disturbance and trapping harvest. Top models included food and human disturbance. Of the four food items examined (caribou, mountain goat, moose and hoary marmot) wolverine occurrence was most closely related to hoary marmot habitat. With regards to human disturbance, they documented a negative association with forestry road density and a positive association with protected areas. Their research suggested that that marmot habitat is important to wolverine in winter and suggest that management actions for conservation prioritize factors related to female occurrence, as these were more clearly defined than male habitat and that human disturbance is a major driver of wolverine distribution (Kortello et al. 2019). The importance of climate was low compared to the food and disturbance hypotheses. However, Kortello (2019) noted that if the forest road density variable is removed from the analysis, persistent spring appears in both the female top models. Hence, they state that their results do not reject the hypothesis that wolverine occurrence is constrained by an obligate association with persistent spring snow, but do suggest the alternative explanation that the relationship between spring snow and wolverine distribution could be functionally related to the distribution of food, disturbance or mortality risk. Kortello (2019) suggested that the negative relationship with forest road density is indicative of anthropogenic disturbance because of the high level of snow machine operation in their study area. They also suggested that avoidance of forestry road density was due to disturbance, rather than trapping because trapping kills were not negatively related to distribution. Protected areas were strongly and positively related to wolverine presence in the top-ranked models and the primary difference between protected areas and the surrounding landscapes in winter is lower human use (Kortello et al. 2019).

Predicting the future of mountain snowpack is complex, with multiple drivers, and with a strong elevation dependence, however topographical aspect can be an important factor for predicting mountain snowpack (Barsugli et al. 2020). Barsugli modeled snowpack in two areas, one in Northwestern Montana and another in Colorado. Their results suggest that springtime snowpack is projected to persist in the upper half of the current denning zone for many future scenarios to the mid-21st century and find a strong dependence of snow loss on topographical aspect such that northerly slopes could provide refugia for snow adapted species.

In North America, wolverines are year-round residents across Alaska and Canada. The southern portion of the species' range extends into high-elevation alpine portions of Washington, Idaho, Montana, Wyoming, California, and Colorado. Wolverines have been verified to reproduce in Idaho, Washington (Northern Cascades), Montana, and northwest Wyoming. Wolverines occur at low densities, range widely, inhabit remote and rugged landscapes away from human populations, and are difficult to detect so conducting research on wolverines is challenging (Idaho Department of Fish and Game 2014). Wolverine populations in Idaho were heavily trapped in the early 1900s and were near extinction. Wolverine population growth and expansion has been documented in the North Cascades and northern Rocky Mountains (U.S. Department of the Interior 2014a). In Idaho, wolverines have been reported in 34 of 44 counties (77%) and presently occur in most, if not all, historically occupied habitat in Idaho (Idaho Department of Fish and Game 2014).

The Idaho Species Diversity Database records (accessed January 2019) show observations of wolverines and other wildlife in Idaho. In that database, a total of 66 observations of wolverines have been documented throughout the plan area from 1962 to 2015. From 1962 to 2015, observation frequency was relatively steady with an average of 1.2 observations per year with 0 to 11 observations recorded annually. Observations were the result of both incidental observations and targeted surveys and were composed of visual observations, tracks identified as wolverine, individuals in hand, and photographs.

Lukacs et al. (2020) conducted a multi-state occupancy study that sought to define the limits to the current distribution, identify potential gaps in distribution, and provide a baseline dataset for future monitoring and analysis of factors contributing to changes in the distribution of wolverines. They used remotely triggered cameras and hair snare DNA samples to develop spatial occupancy models within 183 of 633 potential wolverine that comprised suspected wolverine ranges in these 4 states. Wolverines were detected in 59 of 183 cells (32.2%). Based on occupancy calculations, it was estimated that 268 of the 633 cells (42 percent) were used by wolverines. Wolverines were detected via camera or DNA at another 31 supplemental stations for 93 cells with positive detections. Several cells were sampled within or near the Nez Perce-Clearwater, where both males and females were detected. Their results suggest wolverine habitat is weakly correlated with modeled wolverine habitat but that no other covariates examined were correlated with wolverine occupancy. Occupancy rates were highest in in the Northern Continental Divide Ecosystem, intermediate in the Cascades and central mountains of Idaho, and lower in the Greater Yellowstone Ecosystem. However, reasons for the different occupancy rates are unknown. DNA samples detected wolverine from 240 DNA samples obtained during the survey period, which included 202 samples from 51 official survey stations and 38 samples from 18 supplemental stations. Of these wolverine-positive samples, 145 (60 percent) were of sufficient quality to determine sex and to identify the individual. Both males and females were broadly distributed, and samples identified 26 unique females and 24 unique males. Results demonstrated that all of the large areas of predicted wolverine habitat within the four states contained wolverines.

A few other studies have been conducted on the Nez Perce-Clearwater that indicate wolverine use. In January through March 2018, a multi-species meso-carnivore survey was conducted throughout the Nez Perce-Clearwater, excluding wilderness and roadless areas. During this survey time, one wolverine was detected at one out of four camera stations located in modeled wolverine habitat near Lolo Pass. Two other samples of wolverine DNA were collected in 2015 from hair snare samples near the Adam Ranger Station. These samples were not high enough quality to determine sex or individual identities.

Researchers have developed spatial models to represent wolverine habitat. Current wolverine models include persistent spring snow as a factor in modeling habitat suitability, but different models assess and use this factor in different ways. The U.S. Fish and Wildlife Service initially modeled wolverine habitat across the United States in 2013 (U.S. Department of the Interior 2013e), incorporating the work of two groups of scientists (Copeland et al. 2010, Inman et al. 2011). The model by Copeland et al. (2010) used satellite data to classify areas of persistent spring snow based upon coarse-scale satellite data collected over a seven-year time period from 2000 to 2006, in which snow cover varied from year to year. This model displayed the number of years out of seven that a GIS pixel was classified as snow. Copeland et al. (2010) studied all known wolverine dens in Norway and Sweden, finding that areas with persistent spring snow at least five years out of seven were preferred. Since that time, Inman (2013) produced a more refined model that delineated areas of the western United States predicted to be maternal wolverine habitat suitable for use by reproductive females, primary wolverine habitat suitable for survival and use by resident adults, female dispersal habitat suitable for relatively brief female dispersal movements, and male dispersal habitat suitable for relatively brief male dispersal movements. The models are based on a resource selection function developed with wolverine telemetry locations from 2001 to 2010 in the Greater Yellowstone Ecosystem of Montana, Idaho, and Wyoming (Inman et al. 2012b).

Inman et al., (2013) reported that the United States' northern Rockies include most of the major core areas, the majority of the current population, and connections to larger populations in Canada. They identified six regions that can likely function as major population cores where primary habitats exist as large blocks of relatively contiguous, publicly owned lands that include significant portions of designated wilderness or National Parks and are capable of supporting 50 or more wolverines. These are the Northern Cascade, Northern Continental Divide, Salmon-Selway, Greater Yellowstone, southern Rockies, and Sierra-Nevada regions. Maps in Inman et al., (2013) suggest the plan area retains high levels of connectivity both within the plan area and to other wolverine regions.

The U. S. Fish and Wildlife Service evaluated Inman et al.'s (2013) modeled wolverine primary habitat and noted that 72 percent of their Current Potential Extent of wolverine occurrence in the lower 48 states is on lands managed by the federal government (figure 56), (U.S. Department of the Interior 2018b). They also and estimated that 96 percent of modelled wolverine habitat are owned or managed by Federal agencies and 41 percent of this area is located in designated wilderness areas), (U.S. Department of the Interior 2018b). Analysis of the effects of the proposed action on wolverines and their habitat is based upon wolverine habitat models that are designed and updated by researchers.

The area modeled by Inman et al., (2013) as providing primary habitat encompasses much of the higher elevation areas of the Nez Perce-Clearwater; whereas, the area modeled as providing for maternal habitat is more limited and restricted to only the highest elevations. An estimated 144,371 km^2 (49,258 mi^2) of wolverine habitat occurs in the occupied area in Montana, Idaho, Oregon (Wallowa Range), and Wyoming (U.S. Department of the Interior 2013g). Modeled wolverine habitat from Inman (2013) for Region 1 of the Forest Service is shown in figure 56. While modeled primary wolverine habitat from the model predicts wolverine habitat across the landscape, wolverine maternal habitat is thought to be more limited. Protecting maternal habitat may be important to the conservation of the wolverine.

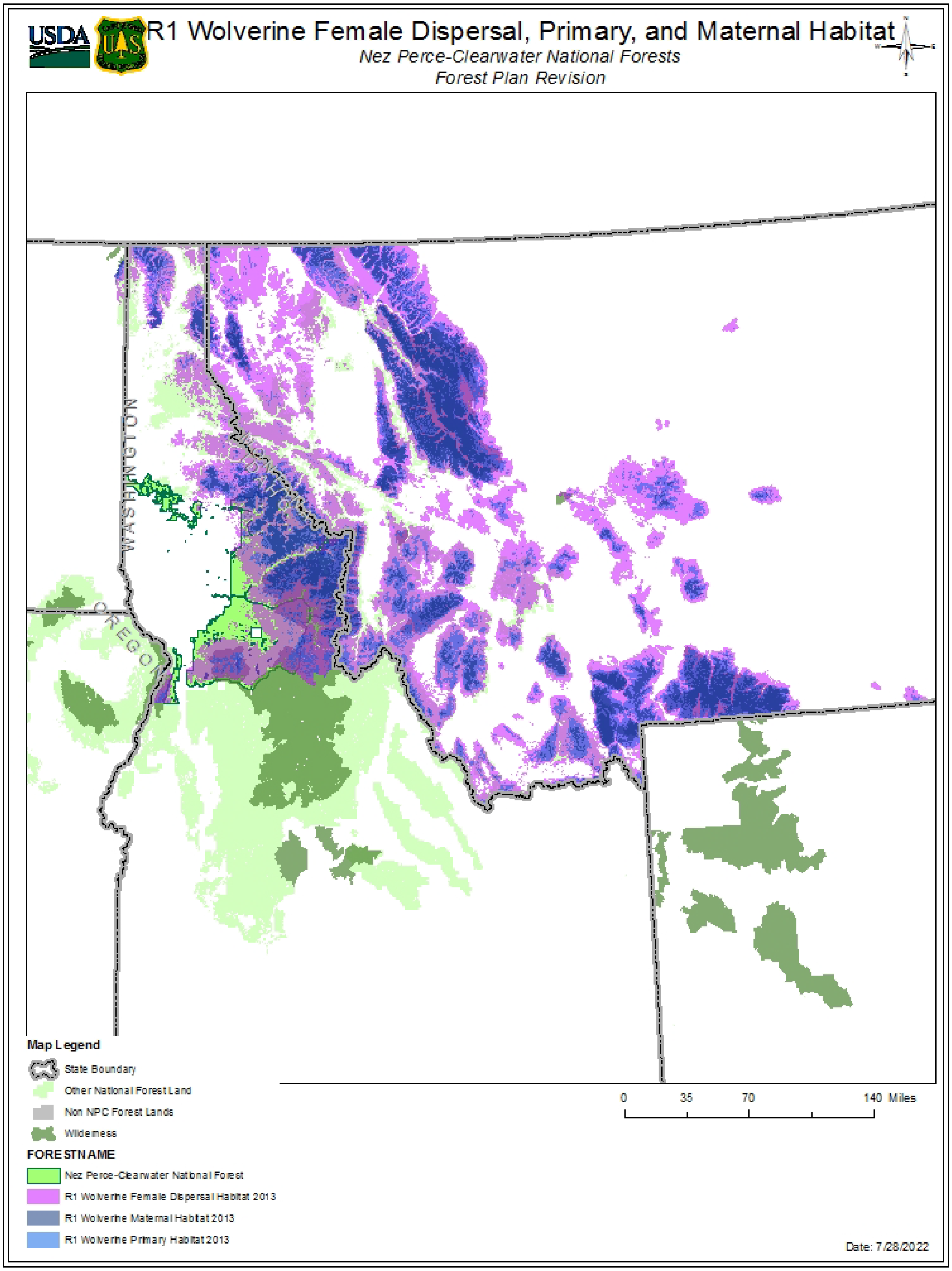


Figure 56 The distribution of modeled female dispersal, primary, and maternal habitat in within Region 1 of the Forest Service.

Wolverine habitat models may be refined in the future as more scientific information becomes available. As Magoun et al. (2017) pointed out, “to manage wolverines and their habitat and incorporate persistent spring snow in models of future wolverine habitat, we must understand the relationship of wolverines to snow and measure persistent spring snow at an appropriate resolution and scale that is biologically meaningful for the species." As summarized by Magoun et al. (2017), the spatial and temporal coarseness of the model and analysis by Copeland et al. (2010) introduced uncertainty regarding the obligatory nature of the relationship between persistent spring snow through May 15 and wolverine habitat. Magoun et al. (2017) stated the "use of snow-covered den sites may not be obligatory through 15 May, or may not be obligatory at the scale in Copeland et al. (2010); nevertheless, wolverines may continue to use snow-covered sites as long as they are available." Magoun et al. (2017) discuss that scattered patches of snow that are not detectable by remote sensing techniques at the den-site scale may persist long enough in spring to provide cover for wolverines, even when considering future climates. These authors encouraged more research on the relationship of wolverines to smaller patches of spring snow at the den-site scale to determine if snow is necessary for successful reproduction; if it must be present for the entire denning season; if other structures, such as boulders or down trees, afford protection for wolverine kits near the end of the denning season; if wolverine distribution is tied to factors that have not yet been measured and defined; or if other possible uses of snow are an important component of wolverine habitat.

Wolverine populations naturally exist in low densities where they occur. According to the U.S. Fish and Wildlife Service (U.S. Department of the Interior 2014a), "within the area known to currently have wolverine populations, relatively few wolverines can coexist due to their naturally low population densities, even if all areas were occupied at or near carrying capacity. Given the natural limitations on wolverine population density, it is likely that historic wolverine population numbers were also low."

Wolverine populations fluctuate in response to prey availability, juvenile dispersal, and mortality of adult females. The U.S. Fish and Wildlife Service stated that the northern Rocky Mountains portion of the North American wolverine population is thought to be the largest subpopulation and the most genetically resilient of the current subpopulations within the United States (U.S. Department of the Interior 2014a). Inman et al. (2013) estimated the current population, as well as the population capacity for regions of the western United States. The Nez Perce-Clearwater is in the Salmon-Selway region. They estimated that the current population in the Salmon-Selway region is near its capacity and estimated to be about 101 individuals out of a capacity of about 105. However, no recent research that would estimate population levels has been conducted for wolverine on the Nez Perce-Clearwater.

Wolverines are constantly on the move and are known to make long-distance movements that are not impeded by topography or deep snow (Copeland and Yates 2006, Squires et al. 2007) nor large rivers like the Salmon River (Idaho Department of Fish and Game 2019). Copeland and Yates estimated that adult female wolverines have home ranges averaging 55 square miles. Adult males ranged over an even larger area, with home ranges that averaged 193 square miles (Copeland and Yates 2006). Home range boundaries are dynamic, as are population demographics.

The threshold for the amount of human activity that can occur before it affects male and female wolverine habitat selection is unknown. Some scientists have expressed concern about the effects of human activities on female wolverines with young kits during the mid-February to mid-May time period because food resources are scarce for foraging females. As the kits mature, the mother will leave them for longer periods of time to find food, but they cannot travel with their mother until the kits are at least 10 weeks old. If a female wants to move kits to a new location, or to another den, she must carry them in her mouth. If the female needs to move the kits very far, the probability of kits dying increases. Reproductive females and kits are at risk of predation (Magoun and Copeland 1998) and females are most vulnerable to energetic pressures due to the high cost of lactation during this period (Krebs et al. 2007). The predominant activity in some portions of wolverine habitat during this time period is winter backcountry recreation.

Threats and Stressors

The FWS service uses five factors to determine whether species should be listed under the endangered Species Act. The Five factors includes: A. the present or threatened destruction, modification, or curtailment of its habitat or range; B. overutilization for commercial, recreational, scientific, or educational purposes; C. disease or predation; D. the inadequacy of existing regulatory mechanisms; and E. other natural or man-made factors affecting its continued existence.

Climate change and inadequacy of existing regulatory mechanisms to climate change and harvesting/trapping and small population size were identified as the primary and secondary threats to the continuous wolverine DPS, respectively, per the USFWS five factor analyses (U.S. Department of the Interior 2013f). The five factors that led to the listing of the wolverine are identified in Table 124.

Table 124. Summary of five factor analysis for North American wolverine analyses (U.S. Department of the Interior 2013f)

Factor	Threat	Findings
A1	Climate Change	Primary Threat
A2	Habitat Impacts due to Human Use and Disturbance (4 categories)	Not a Threat
A2	1) Dispersed Recreation (e.g., snowmobiling and heli-skiing)	Not a Threat
A2	2) Infrastructure Development (e.g., buildings, oil and gas, ski areas)	Not a Threat
A2	3) Transportation Corridors	Not a Threat
A2	4) Land Management (e.g., timber harvest, prescribed burning, grazing)	Not a Threat
B	Harvest (trapping)	Secondary Threat
C	Disease and Predation	Not a Threat
D	Inadequate Regulatory Mechanisms (climate change)	Primary Threat
E	Small Population Size	Secondary Threat

Climate Change

Climate change and inadequate regulatory mechanisms related to climate change is the only primary threat to the wolverine DPS identified by the FWS. Other threats were classified as secondary and only rise to the level of threats to the DPS as they may work in concert with climate change to affect the conservation status of the species (U.S. Department of the Interior et al. 2013).

The Species Status Assessment identifies abiotic and biotic factors when assessing the impact of climate change on wolverines. On abiotic factors it concludes:

“Observed trends and future climate model projections indicate warming temperatures for much of the western United States, including areas within the Current Potential Extent of the wolverine. The degree of future warming varies by region and is dependent upon the future emission scenario used during the modeling process. Future precipitation trends are less certain for many regions, in part, due to naturally high inter-annual variability; some regions are projected to experience greater winter precipitation. Wolverines have been found to have a wide range in critical temperature depending on season and undergo seasonal changes in fur insulation to adapt to warmer temperatures in summer. Wolverines also exhibit changes in behavior, such as moving to higher elevations in summer months. Wolverines continue to occupy areas that have exhibited increases in temperature (e.g., California, parts of Montana and Washington); however, no empirical studies have evaluated these physiological and behavioral adaptations, including sub-lethal effects, relative to warming temperatures.”

The 2013 proposed rule for the North American wolverine identified threats to the long-term persistence of the species. The primary threat, at that time, was determined to be potential changes in climate (U.S. Department of the Interior 2013e), including effects on connectivity of meta-populations. The U.S. Fish and Wildlife Service is currently evaluating potential changes in climate within wolverine habitat based upon more refined models. The effects of climate change are outside Forest Service control, though the forest service has the authority to manage other activities that could affect changing wolverine habitats through time.

According to the models used in an assessment by McKelvey et al. (2011), the Nez Perce-Clearwater, northern Montana, the southern Bitterroot Mountains, and the Greater Yellowstone Ecosystem will retain significant spring snow in the next 50 years; whereas, central Idaho south of the Nez Perce-Clearwater is projected to lose significant spring snow. There are variations in climate models, but models generally indicate earlier snowmelt in the northern Rockies in the future, a pattern that has been ongoing since at least the 1950s. Although wolverines are known to spend the majority of their time at high elevations, the degree to which earlier snowmelt may affect wolverines and the connectivity of metapopulations is uncertain. McKelvey predicted that the geographic extent and connectivity of suitable wolverine habitat in western North America will decline with continued global warming.

At a regionwide scale, the preliminary Northern Rockies Adaptation Partnership risk assessment for the wolverine (Northern Rockies Adaptation Partnership 2015) estimated that the magnitude of effects would be low in 2030 and moderate in 2050, with a high likelihood of effects across all time periods. Across the northern Rockies as a whole, losses of current levels of persistent spring snowpack are estimated to be around 30 percent by mid-century (Northern Rockies Adaptation Partnership 2015). However, it is likely that snow will persist on some slopes and aspects at higher elevations. Due to the low density of wolverine populations, there may continue to be sufficient snow to meet the needs of the population as a whole. There may be microsites important to wolverines, such as mountain cornices, shaded cirque basins, or talus areas that retain snow during most years or retain snow longer into the spring than surrounding areas. McKelvey et al. (2011) stated "although wolverine distribution is closely tied to persistent spring snow cover, we do not know how fine-scale changes in snow patterns within wolverine home range may affect population persistence." The U.S. Fish and Wildlife Service concurred with this finding, stating that "an improved understanding of how microclimatic variation alters the habitat associations of wolverines at fine spatial scales is needed" (U.S. Department of the Interior 2014b).

Although the goods and services provided by National Forest System programs and activities have been, and will undoubtedly continue to be affected by climate change the activities described in the proposed action are not the cause of climate change. Some activities and direction in the plan can mitigate the effects of climate change or act as a sink for greenhouse gases that contribute to climate change. While the agency has no authority over climate change, climate change can interact with forest service activities to exasperate effects of climate change on wolverines. For example, climate change could interact with winter recreation potentially concentrating winter recreation activities into a smaller intensified areas that would be increasingly important to wolverines in the future. Similarly, climate change can interact with wildfire behavior and conditions that result in more high severity acres burned. The desired vegetation conditions can drive management to increase vegetation resiliency to the effects of climate change.

Activities in the plan that could interact with the effects of climate change are the suitability of winter motorized uses within wolverine habitat, plan components for recreation, the coarse filter ecosystem plan components for terrestrial ecosystem, and plan components related to fire management.

Human Disturbance Wolverine Habitat

The USFWS analyzed four broad categories of human disturbance as part of their rulemaking process. This included: (1) Dispersed recreational activities with primary impacts to wolverines through direct disturbance. (2) Disturbance associated with permanent infrastructure. (3) disturbance and mortality associated with transportation corridors Transportation corridors included places where transportation infrastructure and other forms of related infrastructure are concentrated together, such as interstate highways and high-volume secondary highways, often including railroads, retail industrial and residential development, and electrical and other energy transmission infrastructure.; and (4) disturbance associated with land management activities such as forestry, or fire/fuels reduction activities. These four categories are they types of actions that the Forest Plan would guide.

Dispersed recreational activities

Dispersed Recreational activities include snowmobiling, heli-skiing, hiking, biking, off and on-road motorized use, hunting, fishing, and other uses. Dispersed Recreation was not found to be a threat DSP of the wolverine with the USFWS (U.S. Department of the Interior and U.S. Department of Commerce 2013) concluding:

"Overall, human disturbances have likely resulted in some minor, but unquantified, loss of wolverine habitat, but wolverine have also been documented to persist and reproduce in areas with high human use and disturbance, including alpine ski areas and areas with high snowmobile use. It is possible that these forms of habitat alteration may affect individual wolverines, by causing the temporary movement of a few individuals within or outside of their home ranges during or shortly after construction. However, due to the small scale of the habitat alteration involved in these sorts of activities, we conclude that the overall impact of these activities is not significant to the conservation of the species. Dispersed recreation like snowmobiling and back country skiing, and warm season activities like backpacking and hunting, occur over larger scales; however, there is little evidence to suggest that these activities may affect wolverines significantly or have a significant effect on conservation of the DPS. Preliminary evidence suggests that wolverines can coexist amid high levels of dispersed motorized and nonmotorized use (Heinemeyer and Squires 2013), possibly shifting activity to avoid the most heavily used areas within their home ranges."

Heinemeyer et al., (2019) and Kortello et al., (2019) supports the FWS findings that human disturbance in occupied habitat can affect wolverine habitat use but not at the scale that would be a threat to the population. The U.S. Fish and Wildlife Service reaffirmed in the 2018 Species Status Assessment for the Wolverine, that wolverine behavior (movement) can be affected by winter recreational activity. However, they also conclude that results from one long-term study in parts of the wolverine's range in the contiguous United States have found that wolverines can maintain residency in high winter recreational use areas and that wolverines have recently been detected in areas that experience winter recreational activity. They conclude that the effect of winter recreational activity represents a low stressor to wolverines in the contiguous United States at the individual and population level (U.S. Department of the Interior 2018b).

The proposed rule recognized that high recreational use may coincide with wolverine habitat in some areas, and that there may be some localized small-scale effects to wolverines in these areas. The best scientific information available does not substantiate recreational activities as a threat to wolverine (U.S. Department of the Interior 2018b). Therefore, the dispersed recreational activities in the proposed action are not considered a threat to the DPS of the North American wolverine.

The revised forest plan includes plan direction to guide dispersed recreational activities. They include plan desired conditions, objectives, standards and guidelines. Plan components that guide dispersed recreational activities include those in the recreation section, Multiple uses wildlife section, and the ecosystem services section. The plan influences where these activities take place through suitability plan components such as the winter and summer Recreation Opportunity Spectrum Settings, and identification and suitability plan components within recommended wilderness, and designated wilderness.

While the Forest Service recognizes that some of the activities guided by the revised forest plan (proposed action) have the potential to affect individual wolverines and/or their habitat, the U. S. Fish and Wildlife Service concluded that all of these activities are not a threat to the DSP of the wolverine (U.S. Department of the Interior 2013g).

Infrastructure

Infrastructure included all residential, industrial, and governmental developments such as buildings, oil and gas wells, mines, and ski areas. On National Forest System lands it could also include the infrastructure associated with grazing allotments, communication sites, developed campgrounds, visitor centers, and other administrative sites. Such developments may affect wildlife directly by eliminating habitats, or indirectly by displacing animals from suitable habitat near developments (U.S. Department of the Interior 2013g).

The revised forest plan does not authorize or establish infrastructure. Instead, it sets the guidance under which infrastructure is managed. It does so with plan land allocations, plan components associated with land allocations, and components that guide infrastructure desired conditions, and restrictions. The revised forest plan contains direction for building suitability, mineral suitability, an infrastructure section specific to infrastructure however, the focus of infrastructure there is the transportation system. The revised forest plan contains direction that guides the development of buildings, mineral extraction, campgrounds, communication sites, and other administrative sites. These include land allocations and their suitability plan components, desired conditions, standards and guidelines.

The FWS concluded that wolverines do not avoid human development of the types that occur within suitable wolverine habitat and that there is no evidence that wolverine dispersal is affected by infrastructure development (U.S. Department of the Interior 2013e). It further stated that there is no evidence that human development and associated activities are preventing wolverine movements between suitable habitat patches (U.S. Department of the Interior 2013e). The proposed actions related to infrastructure maintenance and developments are not a threat to the DPS of the North American wolverine.

Transportation Corridors

This human use category covers places where transportation infrastructure and other forms of related infrastructure are concentrated together, such as interstate highways and high-volume secondary highways, often including railroads, retail industrial and residential development, and electrical and other energy transmission infrastructure.

The Idaho Transportation Department has authority to manage highways on the Nez Perce-Clearwater. Wolverine mortality from collisions with vehicles has occurred in the state but at low levels. Wolverines do not usually come into contact with high-traffic-volume roads, except in those areas where highways cross over mountain ranges, such as major passes. Wolverines killed on roads in valleys between mountain ranges are likely the result of dispersal attempts by wolverines, but these appear to be rare occurrences (U.S. Department of the Interior 2013e). The Nez Perce-Clearwater contains Lolo Pass and Hoodoo Pass, which may have a higher chance of a wolverine strike due to their high elevation and proximity to wolverine habitat. Most of Highway 12 and Highway 14 occur at lower elevation not considered primary habitat, but a wolverine crossing through the plan area might have to cross these highways. The FWS (2018b) evaluated roadkill and concluded “Roads present a low stressor to wolverines at the individual and population level in most of its current contiguous United States range.” Their basis for that conclusion was that there was a low proportion of major highways in both modeled primary habitat and a low mean density of roads at high elevations where wolverines have been observed. They suggest that the effects of roads continue to be at low levels in the future and that there is no information that indicates that mortality from roads or disease would increase within the range of wolverine in the contiguous United States in the future.

Transportation corridors and urban development in valley bottoms between patches of wolverine habitat may inhibit individual wolverines’ movement between habitat patches; however, wolverines have made several long-distance movements in the recent past that indicates they are able to navigate current landscapes as they search for new home ranges. The FWS (2013a) concludes that have no evidence to suggest that current levels of transportation infrastructure development or residential development are a threat to the DPS or will become one in the future.

The revised forest plan includes plan direction to guide land management activities. They include plan desired conditions, objectives, standards, and guidelines. The plan influences where these activities take place through land allocations, the prevailing management in those land allocations, and the associated suitability plan components. Examples of these plan components includes direction in the Infrastructure section, the Recreation Section, the and the Aquatic Ecosystems Section, the and Wildlife Section of the revised forest plan. Land allocations that influence future motorized use development and access include the Summer and Winter Recreation Opportunity Spectrum, Recommended Wilderness, Designated Wilderness direction, Designated, Eligible and Suitable Wild and Scenic River direction, direction for the National Historic Landmark, Research Natural Area direction, and Idaho Roadless Rule area direction.

The type of development that constitutes a transportation corridor is not typically done by the Forest Service and no transportation corridor development is anticipated under this analysis. However, some Forest Service facilities may occur in established transportation corridors, but the maintenance and operation of such facilities are not considered a threat to the DPS of the North American wolverine. The U.S. Fish and Wildlife Service (2013e) stated that it is unlikely that wolverines avoid the type of low-use forest roads that generally are found in wolverine habitat. Based on the best available science, the U.S. Fish and Wildlife Service concluded that wolverines do not avoid human development of the types that occur within suitable wolverine habitat and that there is no evidence that wolverine dispersal is affected by infrastructure development. The U.S. Fish and Wildlife service concluded in their 2018 Species Status Assessment that roads present a low stressor to wolverines at the individual and population level in most of its current contiguous United States range (U.S. Department of the Interior 2018b).

Land Management

Land management included grazing, timber harvest, and prescribed burning. Wildland fire is likely to temporarily displace wolverines, which could affect home range dynamics. Given that wolverines can travel long distances in a short period of time, individuals would be expected to move away from fire and smoke.

In addition, the Idaho State Wildlife Action Plan includes measures to address fire threats to the wolverine and its habitat, including removal of perceived barriers to allow more prescribed natural fire on State and private forest lands and promoting/facilitating the use of prescribed fire as a habitat restoration tool, on both public and private lands where appropriate, and leaving fire-killed trees standing as wildlife habitat if they pose no safety hazard, all in an effort to restore a more natural fire interval that allows for return to historical forest conditions.

Given the diversity of habitats occupied by wolverines, their occupancy of high elevations, and extensive mobility, wildland fire represents a limited stressor, in scope and scale, to wolverine habitat and its prey in the contiguous United States range.

Wolverines have adapted to systems that undergo periodic disturbance like wildfire and thus are assumed to be adapted to these disturbances. However, climate change may interact with fuel conditions to change wildland fire extent and behavior. The U.S. Fish and Wildlife Service's (U.S. Department of the Interior 2018b) Species Status Assessment for the North American wolverine concluded that wildfire was a low impact threat but acknowledged that wildfire disturbance could be changed by climate change. They stated:

> *"In summary, based on these projections, wildland fire risk is likely to increase in the western United States, with future patterns and trends of wildland fire dependent on several factors (e.g., degree of warming and drought conditions, fuel and soil moisture, wildland fire management practices, elevation) and geographic region. Based on the best available information, the cumulative effects of wildland fire and climate change (e.g., snowpack) will continue to represent a low impact to the wolverine and its habitat into the mid-21st century, based on climate change projections."*

Regarding land management activities, the USFWS in their listing decision (U.S. Department of the Interior 2013g) stated:

> *"Land management activities (principally timber harvest, wildland firefighting, prescribed fire, and silviculture) can modify wolverine habitat, but appears to be little affected by changes to the vegetative characteristics of its habitat. In addition, most wolverine habitat occurs at high elevations in rugged terrain that is not conducive to intensive forms of silviculture and timber harvest. Therefore, we anticipate that habitat modifications resulting from these types of land management activities would not significantly affect the conservation of the DPS, as we described above"*

The U.S. Fish and Wildlife Service assessed the effects of a variety of human activities that can affect wolverines and their use of habitat. The U.S. Fish and Wildlife Service (2013e) stated:

> *"Few effects to wolverines from land management actions such as grazing, timber harvest, and prescribed fire have been documented. Wolverines in British Columbia used recently logged areas in the summer and moose winter ranges for foraging (Krebs et al. 2007). Males did not appear to be influenced strongly by the presence of roadless areas (Krebs et al. 2007). In Idaho, wolverines used recently burned areas despite the loss of canopy cover (Copeland 1996).*
>
> *Intensive management activities such as timber harvest and prescribed fire do occur in wolverine habitat; however, for the most part, wolverine habitat tends to be located at high elevations and in rugged topography that is unsuitable for intensive timber management...Wolverines are not thought to be dependent on specific vegetation or habitat features that might be manipulated by land management activities, nor is there evidence to suggest that land management activities are a threat to the conservation of the species."*

The revised forest plan includes plan direction to guide land management activities. They include plan desired conditions, objectives, standards and guidelines. The plan influences where these activities take place through land allocations, the prevailing management in those land allocations, and the associated suitability plan components. Examples of these plan components includes direction in the Terrestrial Ecosystems, Fire Management, Rangeland Resources, and Timber sections of the plan. The land allocations and associated suitability plan components that affect the location of these activities include the Management Areas, Timber Suitability, the Recommended Wilderness, Idaho Roadless Rule areas, Wild and Scenic Rivers areas, the Research Natural Areas, The Wild and Scenic Rivers direction, and the Wilderness Area direction.

Because wolverines are not dependent on specific vegetation or habitat features, infrastructure development and maintenance (secondary roads, communication sites, campgrounds, etc.) and land management activities (such as recreation, grazing, timber harvest, and prescribed fire) conducted on National Forest System lands were determined not to be a threat to the DPS (U.S. Department of the Interior 2013b).

Harvest (Trapping)

According to Forest Service Handbook 2640, hunting, fishing, and trapping of fish and wildlife and associated practices on National Forest System lands are subject to State fish and wildlife laws and regulations, unless one or both of the following apply:

1. State fish and wildlife laws and regulations conflict with Federal laws; or
2. State laws and regulations would permit activities that conflict with land and resource management responsibilities of the Forest Service or that are inconsistent with direction in forest plans (U.S. Department of Agriculture 2003)).

Wolverine trapping is prohibited by state laws in all of the lower 48 states. Trapping wolverines has been prohibited in Idaho since about 1965. Fourteen incidentally trapped wolverines have been reported during Idaho furbearer seasons since 1965. Eight of the incidental catches were released alive and six resulted in mortality. From 1965 to 2014, non-target catches accounted for an average of 0.29 wolverines annually with 0.12 wolverine catches resulting in mortality (Idaho Department of Fish and Game 2014). This count included four wolverines incidentally trapped during the 2013 to 2014 furbearer season. These statewide numbers suggest that incidental trapping of wolverine is uncommon in Idaho and results in fewer mortalities than trapping incidences. The effects from incidental trapping are largely outside of Forest Service control, except regarding how access decisions inadvertently facilitate or impede trapping activities. Based on the data, incidental trapping does not appear to be a substantial threat to wolverine populations. The effects from incidental trapping are largely outside of Forest Service control, except regarding how access decisions inadvertently facilitate or impede trapping activities.

Predator control programs targeting wolves, including poison and incidental trapping, can result in incidental losses of wolverines (Committee on the Status of Endangered Wildlife in Canada 2014). Specific to wolf control for livestock protection in Idaho, three wolverines have been trapped incidental to authorized wolf control activities since 1995, with two released alive and one animal euthanized (Idaho Department of Fish and Game 2014). Preventive measures have been adopted to reduce these incidental captures, including implementation of educational programs to minimize incidental capture of wolverines during trapping seasons (Idaho Department of Fish and Game 2014). Licensed wolf trappers are required to complete a Wolf Trapper Education course with specific instruction for reducing incidental trapping of wolverine, Canada lynx, and other non-target species (Idaho Department of Fish and Game 2014). In addition, the U.S. Department of Agriculture Wildlife Services (Wildlife Services) agency has also temporarily stopped (as of April 2017) using cyanide predator control devices in the State of Idaho (U.S. Department of the Interior 2018b).

Snowmobiles have allowed for better access for hunters and trappers and may be increasing the number of wolverines harvested in its northern North America range; however, the areas of exploitation are still relatively small, concentrated areas, and large areas of refugia continue to be found), (U.S. Department of the Interior 2018b).

The FWS (2018b) concluded that wolverine populations in much of North America are still recovering from large losses of individuals from intensive hunting and unregulated persecution pressures in the late 1880s into the mid-20th century and that legal trapping or hunting of wolverines is currently prohibited in the contiguous United States. Incidental trapping of wolverines is infrequent in the contiguous United States and, in Idaho and Montana, education programs are being implemented to reduce this stressor (U.S. Department of the Interior 2018b).

The Idaho Department of Fish and Game issues permits allowing live capture, handling, and release of wolverines for scientific studies, which usually involved log box-traps that do not cause physical injury to the captured animals (Idaho Department of Fish and Game 2014). The agency also issues scientific collection permits to various agencies and organizations and to IDFG biologists that can include the capture, chemical immobilization, and placement of radio-collars/radio-markers on wolverines (Idaho Department of Fish and Game 2014). These permittees (and IDFG staff) are required to comply with animal trapping and handling protocols approved by IDFG's Wildlife Health/Forensic Laboratory and other animal welfare and research institutions.

The U.S. Fish and Wildlife Service concluded in their 2018 Species Status Assessment that overutilization does not currently represent a stressor to the wolverine in the contiguous United States at the individual, population, or species level. Wolverine populations in the contiguous United States are currently protected under several State laws and regulations. Hunting and trapping activities for wolverines are currently suspended or closed entirely for animals within the contiguous United States, though occasional incidental trapping can occur. Trapping in Montana, Alaska, and Canada has been and appears to be sustainable. Trapping or harvesting of wolverines along the contiguous U.S.–Canada border does not represent a stressor to wolverines migrating into the contiguous United States at the individual or population level. In addition, wolverine populations along the Alaska–Canada border are continuous with the Yukon region of Canada, which suggests a rescue effect for Canadian populations along this international boundary.

The proposed plan contains plan components that encourage ecosystem services and multiple uses including trapping and hunting. Those related to uses like hunting, trapping and gathering include the Multiple Uses Wildlife section, the Tribal Treaty Rights section, and the Ecosystem Service Section of the Plan. The plan indirectly influences hunting and trapping through access. Forest Plan land allocations that influence future motorized use development and access include the Summer and Winter Recreation Opportunity Spectrum, Recommended Wilderness, Wilderness direction, Designated, Eligible and Suitable Wild and Scenic River direction, Aquatic Resources especially for Riparian Areas, Research Natural Area direction, and Idaho Roadless Rule area direction.

The U.S Fish and Wildlife Service in their listing decision concluded that trapping, including known rates of incidental trapping in Montana and Idaho, result in a small number of wolverine mortalities each year and that this level of mortality by itself would not be a threat to the wolverine DPS (U.S. Department of the Interior 2013d).

Inadequate Regulatory Mechanism

Inadequate Regulatory Mechanism relates to existing regulatory mechanisms, the Jaws and regulations (either state or federal) currently in place, and whether or not they are adequate to protect wolverine. With respect to the area covered under the proposed action (Forest Service, Region 1), as pointed out earlier, approximately 94 percent of currently occupied wolverine habitat in the contiguous United States is federally owned and managed, mostly by the U.S. Forest Service. For the segment of the wolverine population under consideration in this analysis (in occupied areas of Montana, Idaho, Wyoming, and the Wallowa Range in Oregon), almost 60 percent of wolverine habitat is located in areas that already offer a high level of protection from human related disturbances (32. 7 percent in designated Wilderness, 6 percent in inventoried road less areas, and 9.5 percent in National Parks) (U.S. Department of the Interior 2018b). On National Forest System lands in Region 1, the existing regulatory mechanisms already providing some level of protection (U.S. Department of the Interior 2018b) to wolverine habitat include:

Wilderness Act of 1964 (16 U.S.C.l311-13l6): Prohibits motorized equipment and development of new roads and structures in designated areas.

National Environmental Policy Act of 1972 (42 U.S.C. 4321 et seq): Implements regulations of this disclosure law requires a site-specific discussion of environmental impacts of various project alternatives, and identification of any unavoidable adverse environmental effects, or irreversible or irretrievable commitments of resources.

National Forest Management Act of 1976, as amended (16 U.S.C. 1600-1614): Requires the 1 Forest Service to strive to provide for a diversity of plant and animal communities when managing National Forest System lands.

Endangered Species Act of 1973(PL 93-205, as amended): If the wolverine is listed, the protections and regulatory mechanisms of this act would also come into play. If not listed, the wolverine would revert to its former status as a Region 1 Sensitive Species as noted in the Federal Register (U.S. Department of the Interior 2018b).

While not specifically identified, the Idaho Roadless Rule and Designated Wild and Scenic Rivers also likely provides some regulatory mechanisms to protect wolverines from some activities such as road building, timber harvest, and some mining activities and protection of rivers and their corridors. The proposed action does not include any planned changes to Designated Wilderness, Idaho Roadless Rule, nor any of the acts identified above. It does consider and make changes to recommended areas such as recommended wilderness, and eligible wild and scenic rivers. the existing regulatory mechanisms. The USFWS has concluded that the current regulatory mechanisms in place at the national and State level adequately address the identified short-term site-specific threats to wolverine: direct loss of habitat; disturbance by humans; and direct mortality from hunting and trapping (U.S. Department of the Interior 2013a).

Small Population, Connectivity and Wolverine Habitat

In their listing decision, the USFWS discusses other natural or man-made factors affecting the continued existence of the wolverine including small population and genetic diversity of wolverines. Genetic diversity is related to connectivity.

The wolverine SSA report (U.S. Department of the Interior 2018b) presents information from genetic and observational studies suggesting that wolverine move across the international border of the contiguous United States and Canada. Mitochondrial analysis provides support that all contiguous United States historical and contemporary wolverine populations are likely descendants of immigrants from Canada (U.S. Department of the Interior 2018b). The FWS considers wolverines that occupy the contiguous United States to be genetically continuous with wolverines in adjacent Canadian provinces and that wolverines are not genetically isolated from wolverines in Canada (U.S. Department of the Interior 2020b).

Cegelski et al. (2006) found wolverines in Idaho to have the lowest genetic diversity levels among eight populations evaluated across the Rocky Mountains and high levels of genetic structure. They concluded, despite some evidence of immigration of wolverines from Canada to the United States, Idaho populations were genetically isolated, even from populations in Montana. However, the sample size used for evaluating the Idaho population was small (n=15) and limited to central Idaho (U.S. Department of the Interior 2018b). Overall, wolverines in the northern Rockies exist as small and semi-isolated subpopulations within a larger metapopulation that requires regular dispersal of individuals between habitat patches for maintenance (Aubry et al. 2007, Inman et al. 2013).

Inman et al. (2013) stated "the greatest potential for wolverine dispersal was concentrated in western Montana and along Montana's borders with Idaho and Wyoming proximate to this area." This modeling suggests the Nez Perce-Clearwater provides, and will continue to provide, for connectivity because it is a large contiguous block of publicly owned land that contains high amounts of wilderness and roadless areas.

Schwartz et al. (2009) mapped wolverine connectivity with least cost path methods. Predicted connectivity was highest in the plan area along the Idaho-Montana border. Schwartz et al. (2009) identified the Bitterroot Mountains between Montana and Idaho as a critical artery of gene flow. This area genetically links wolverines of central Idaho to those in the Bob Marshall Wilderness and Glacier National Park in Montana and through them on to Canada.

(Carroll et al. 2020) used empirical data to test hypotheses about connectivity for wolverine. They suggested that once outside of habitat suitable for a home range, wolverines are willing to move through low quality habitat and are only moderately sensitive to changes in habitat quality. However, they found that there is still some lower threshold of dispersal habitat quality for wolverines, as dispersing wolverines follow lower-resistance pathways that connect high-quality habitat and do not move indiscriminately across the landscape. Wolverines appear to have far more flexibility in what they can disperse through compared to what they move through during routine within home range movements, but that some level of selection is occurring. These findings have important implications for the long-term success of the wolverine metapopulation, which requires open space in valley bottoms that links the mountain ranges of the Western US. They found that there may be more flexibility in the location of these low-elevation open spaces than previously thought. Their best performing model shows high wolverine connectivity across the Nez Perce-Clearwater National Forests.

In its analysis, the FWS focused on the wolverine's small population size and low genetic diversity as potential impacts and concluded that they are threats when considered cumulatively with projected habitat loss due to climate change.

The plan contains plan direction that would maintain connectivity, primarily via land allocations and their associated suitability plan components. These primarily include allocations and direction for Idaho Roadless Rule, designated wilderness, recommended wilderness.

Summary of Threats

In summary the primary threat to wolverines is climate change as a primary threat and trapping as a secondary threat. However, the USFWS reevaluated the status of the wolverine in their 2018 Species Status assessment for the North American Wolverine (U.S. Department of the Interior 2018b). In relation to threats and stressors to wolverines they stated the following:

> *"We evaluated several potential stressors that may be affecting wolverine populations or its habitat, including effects from roads, disturbance due to winter recreation and other activities, effects from wildland fire, disease and predation, and overutilization for (primarily) commercial purposes. We determined that the effects of roads (evaluated by number of miles, density, and location) and disturbance represent low level stressors to the wolverine in the contiguous United*

States. Wildland fire was determined to be a short-term stressor to wolverine habitat and its prey. Disease and predation are not considered stressors to the wolverine."

In their executive summary for the 2018 status assessment, they concluded the following in regard to stressors:

"Demographic risks to the species from either known or most likely potential stressors (i.e., effects from roads, disturbance due to winter recreational activities, effects of wildland fire, and overutilization) are low based on our evaluation of the best available information as it applies to current and potential future conditions for the wolverine and in the context of the attributes that affect its viability. We analyzed the potential effects of climate change to wolverine habitat, including snow persistence in the Northern and Southern Rocky Mountains. The future timeframe evaluated in this analysis is approximately 38 to 50 years. This range represents our best professional judgment of the projected future conditions related to climate change for the western United States, wildland fire conditions, or other potential cumulative impacts. While population information is lacking for this subspecies in some parts of its range, the best available information does not indicate that, winter recreational activities, infrastructure features, mortality from road crossings or trapping (authorized and incidental), currently or in the future will result in a decline in the subspecies across its range. Our evaluation of climate change indicates that snow cover is projected to decline in response to warming temperatures and changing precipitation patterns, but this varies by elevation, topography, and by geographic region. In general, models indicate higher elevations will retain more snow cover than lower elevations, particularly in early spring (April 30/May1). Further, significant snow persistence (greater than 0.5 meters (20 inches)) is projected at high elevations."

The plan contains direction that would guide many actions which are not impactful to wolverines or that do not influence threats to wolverines. Therefore, the analysis does not analyze every aspect of the plan but instead focuses on features of the plan that would influence the five factor threats identified by the U.S. Fish and Wildlife Service. Based on threats identified in this analysis will evaluate how the plan influences human use and disturbance including recreation, infrastructure, transportation, and land management activities such as timber harvest. Specific direction in the plan related to these categories include the Recreation Opportunity Spectrum, summer and winter motorized suitability, vegetation management including timber suitability, objectives for timber harvest, vegetation restoration, prescribed fire, fire management, fuels reduction, mining, infrastructure development, and wolverine harvest (trapping). While the plan doesn't influence climate change, it has direction that encourages climate resilience and acts as a carbon sink. While the plan doesn't control wolverine populations, connectivity provided by the forest influences gene flow. The analysis also evaluates how the allocation and management of wilderness, recommended wilderness, and Idaho Roadless Rule Management would conserve wolverine habitat. The supporting information about the conclusions above from the 2013 proposed rule and 2018 Species Status Assessment are incorporated by reference into this BA.

Affected Environment and Baseline

Wolverine habitat is distributed at the higher elevations across the Nez Perce-Clearwater National Forest, with substantial amounts of habitat concentrated eastward towards the Idaho-Montana border. Wolverine habitat as modeled by Inman (2013) includes primary habitat, maternal habitat, and female dispersal habitat. The Nez Perce-Clearwater has approximately 753,576 acres of maternal habitat, 1,334,238 acres of primary habitat, and 3,024,135 acres of female dispersal habitat (GIS layer of modeled habitat based on Inman (2013)). The Nez Perce-Clearwater has a total of 1,334,238 acres of primary wolverine habitat which makes up about 12.6 percent of the 10,554,788 acres of wolverine primary habitat within the Northern Region of the Forest Service. The majority of wolverine habitat in the planning area occurs within designated wilderness, recommended wilderness, or Idaho Roadless Rule Areas. For example, only 93,487 acres of modeled primary wolverine habitat or about seven percent of the Nez Perce-Clearwater National Forest total is within general forest areas (managed to emphasize multiple uses). Similarly, only 35,024 acres or about 4.6 percent of modeled maternal wolverine habitat is within general forest areas. The total amount of modeled wolverine habitat is shown in Table 125.

Table 125 The acres of modeled wolverine habitat found within the Nez Perce-Clearwater National Forests, the total within Region 1, and the percent of the Region 1 total represented by the wolverine habitat within the Nez Perce-Clearwater National Forests.

Type of Wolverine Habitat (based on Inman et al. 2013)[1]	Total Acres within the Nez Perce Clearwater	Total Acres within the U.S. Forest Service Region 1	Percent of Region 1 Wolverine Habitat Within the Nez Perce Clearwater
Maternal	753,576	4,822,636	15.3
Primary	1,334,238	10,554,788	12.6
Female Dispersal	3,024,135	24,884,989	12.2

1. (Inman 2013)

Maternal and primary habitat is primarily situated at higher elevations and have relatively low road densities when compared to dispersal habitat, which occupies lower elevation areas with higher levels of human access. Primary and maternal habitats support a wide range of potential wolverine prey, including small and medium-sized mammals particularly marmots, deer, elk, moose, bighorn sheep, and mountain goat. Modeled maternal wolverine habitat is the most limited compared to primary and female dispersal habitat. Modeled maternal wolverine habitat is also the most important regarding the effects analysis because it indicates the effects to wolverine reproduction.

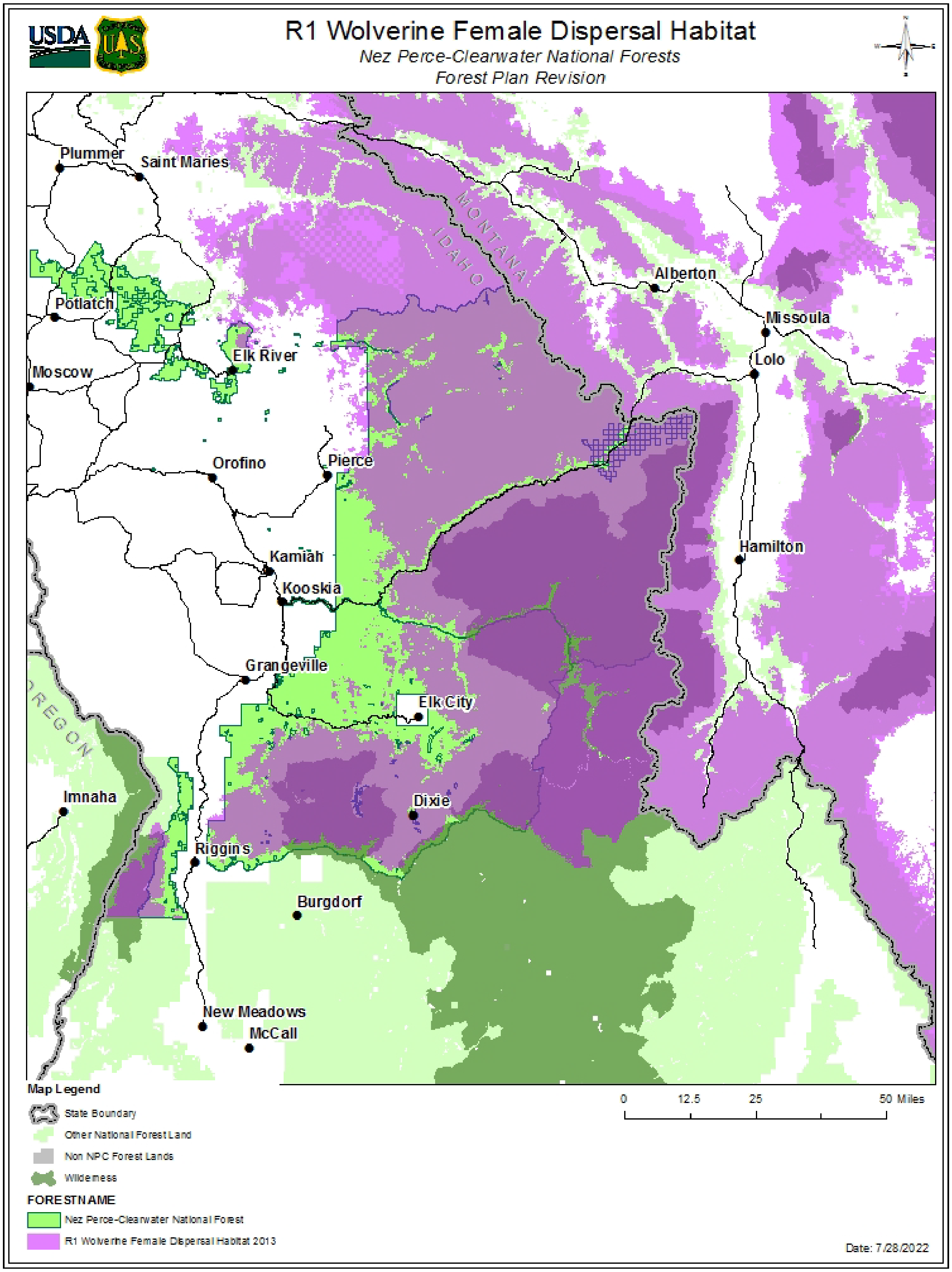


Figure 57 The distribution of female dispersal habitat within the Nez Perce-Clearwater National Forests.

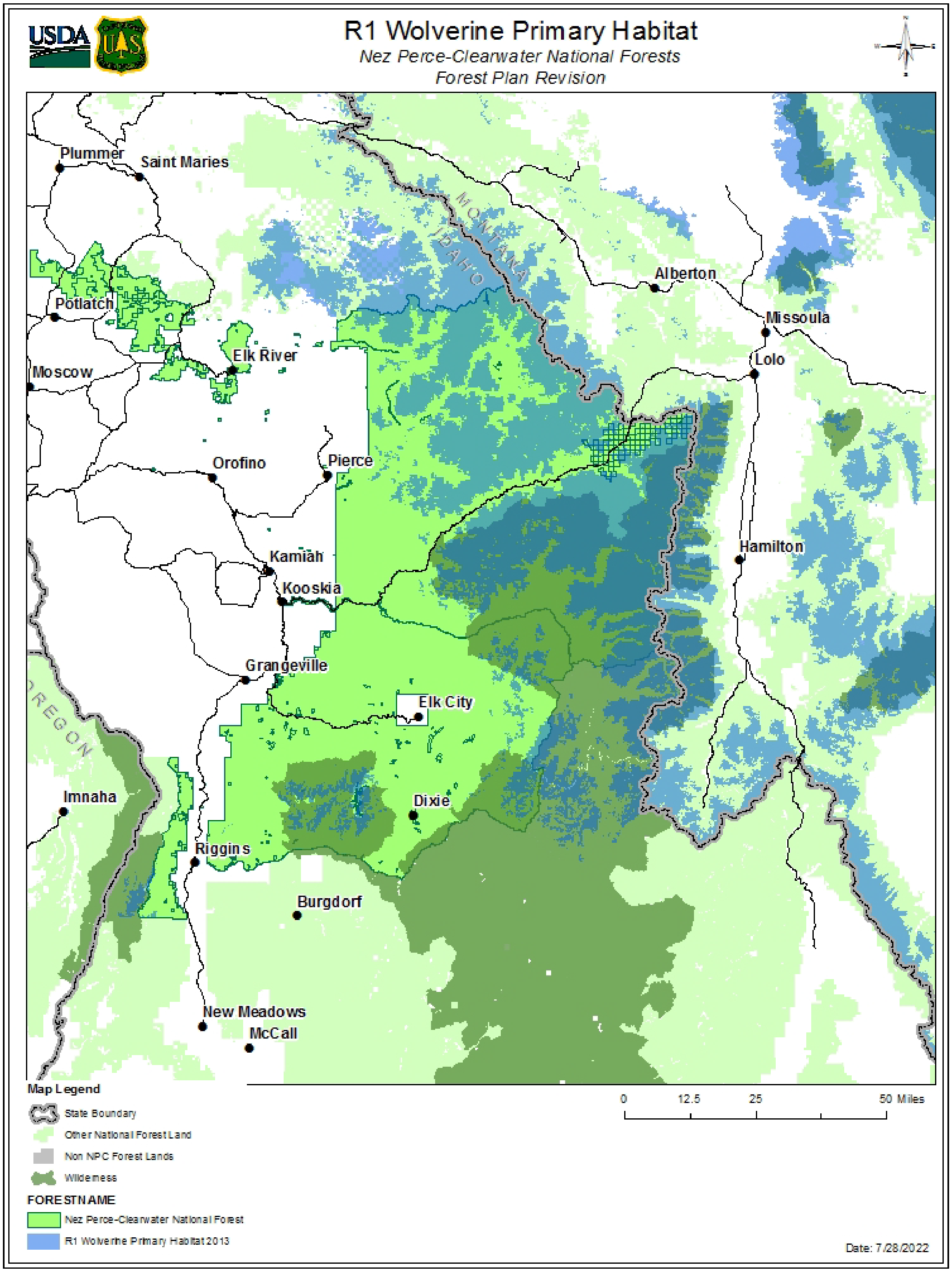


Figure 58 The distribution of modeled primary wolverine habitat within the Nez Perce-Clearwater National Forests.

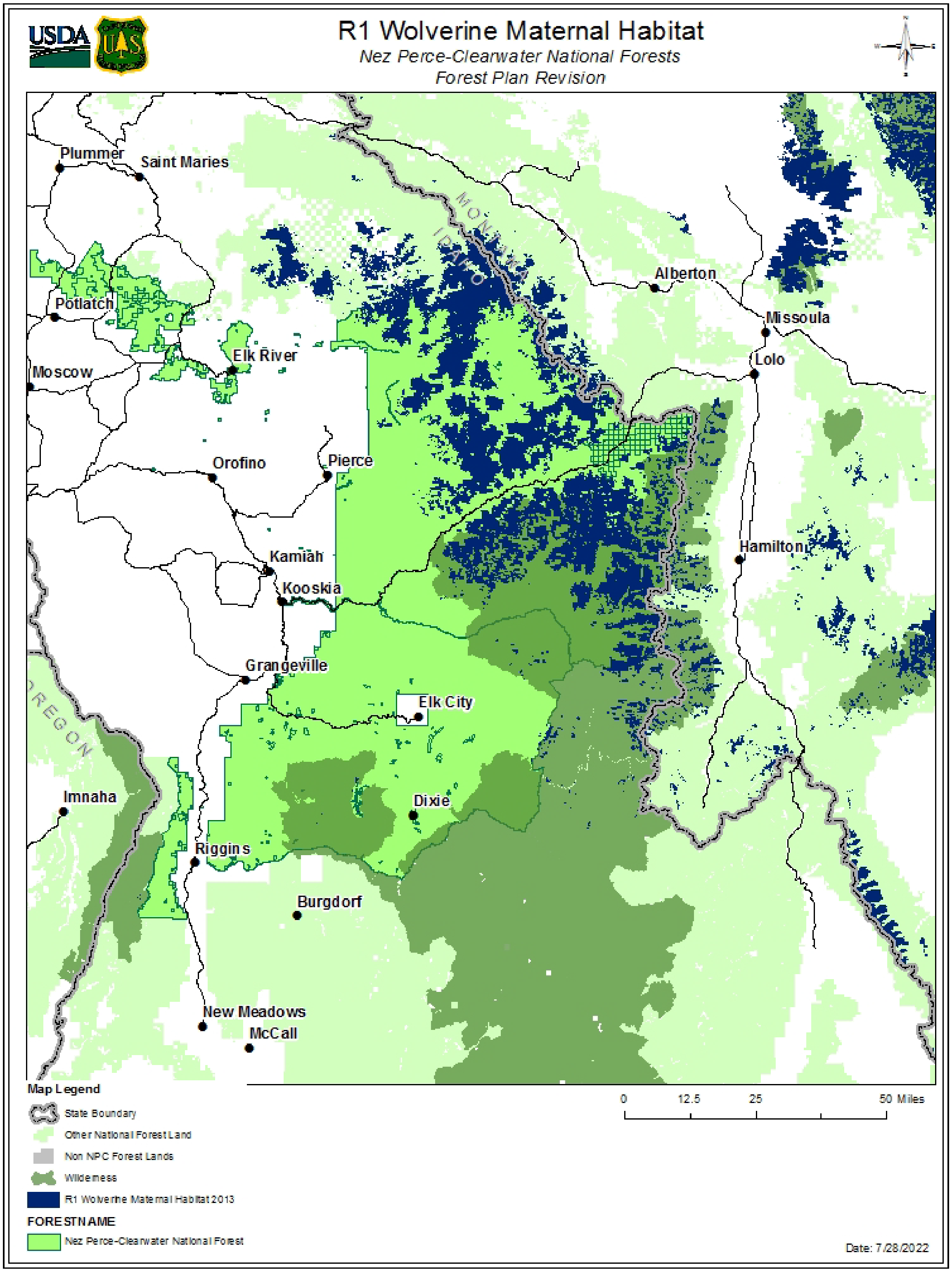


Figure 59 The distribution of modeled maternal wolverine habitat within the Nez Perce-Clearwater National Forests.

Methodology and Analysis Process and Indicators

The purpose of this Forest Plan programmatic analysis is to describe and analyze the guidance the revised forest plan provides that directs a variety of projects routinely conducted on National Forest System lands. The guidance in the forest plan is essentially the rule set that manager must follow when implementing projects conducted after the plan is finalized. Forest plans contain several decisions that influence where, why, when, in some cases how, and how much of the different types of projects are conducted. The Forest plan also includes restrictions on a where, when why and in some cases how activities must be conducted for the protection of resources. The guidance in forest plans direct where activities can or cannot occur and the prevailing management guidance on those lands through land allocations and their associated direction. The objectives set the number of activities needed to achieve the desired conditions or provide ecosystem services. The standards and guidelines are the restrictions imposed on projects. The analysis is not evaluating the effects of the projects themselves, but rather the effects the guidance would have in guiding the way the projects are conducted, where the projects are conducted, how the projects are guided and what the expected outcome on the ground the projects would result in over the life of the plan. The types of projects expected to occur under the direction of the plan were described above. The analysis below attempts to evaluate how the plan decisions affects or addresses the five factors utilized to determine that the wolverine should be listed under the ESA.

The land management allocations are one of the key factors in the revised forest plan that influence how the plan conserves wolverine habitat and likewise is one of the key factors that indicate where activities that could impact wolverines could potentially occur. Land allocations are comparable to zoning, in that they allocate lands for particular types of management. Land management allocations set the prevailing direction for those lands (for example lands managed for multiple uses, lands managed for roadless character, or lands managed with the restrictions associated with wilderness) and identify which activities are consistent with that prevailing direction. To do so, they identify which uses are and are not suitable on those lands. Land allocations also identify which lands are recommended for congressional designations like wilderness and wild and scenic rivers. Often, different lands are managed with different emphasis on resources with the emphasis driving which activities could be expected to occur on those lands. In this way, the activities would or would not happen on those lands but for the land allocations and associated direction.

Thus, the overlap of wildlife habitat with the land allocations in many ways dictates the types of activities that could potentially impact that habitat. For example, habitats within lands allocated to emphasize timber production would be reasonably certain to experience that activity. Whereas habitat within lands managed as recommended wilderness where timber production is not a suitable use, it would be expected that wildlife nor habitats within that land allocation would not experience that activity. Land allocations set direction that guides many activities that influence or address activities identified under the five factors utilized to determine listing for wolverines. Thus, a major indicator for not only the extent but the intensity of activities on those lands are the land allocations because it indicates which wildlife habitat would experience different uses or activities. Similarly, the extent to which lands are protected from such uses are also in large measure dictated by land allocations because unsuitable uses would not occur on those lands.

Suitability plan components are restrictions or permissions associated with land allocations and identify whether some types of activities are suitable or not for those activities. If the activity is suitable on a given management area or land allocation, then that activity is a suitable use and could potentially occur on those lands. When an activity is not a suitable use, that activity cannot occur on those lands and in that way, are a restriction. Thus, a useful indicator for the effects to species like wolverine is the extent to which land management allocations overlap with wolverine habitat. Therefore, most widespread factor in the plan that would either protect or potentially affect wolverine habitat are the land management allocations and their associated suitability of uses because they determine management across wide areas. It should be noted that even when suitable, it takes a subsequent site-specific analysis and consultation to authorize such uses. The other plan components guide the reason for, the amount and the way projects or activities are carried out. Thus, plan components drive the types, amounts, and modify those activities when they are conducted on lands suitable for those activities when they are conducted.

Take an activity like timber production and harvest for example. Timber production is suitable on lands allocated for multiple uses (Management Area 3) and are expected to see the bulk of the timber production projects, acres and impacts. Plan objectives determine how much timber production occurs. Desired conditions direct the desired vegetation conditions towards with timber projects are trying to achieve over time and provide the purpose and need for projects. When timber projects do occur on multiple use lands, plan standards or guidelines direct how timber projects are conducted for the protection or sustainability of resources. For example, plan components control the types of harvest used, the size of openings, how many live trees or snags are retained, when and how many new trees must be planted, how much woody materials must remain on the ground, how soils are conserved or restored, which measures must be employed to control sedimentation, and so forth. In contrast, timber production is not suitable on lands allocated for wilderness management so would not be expected to experience any timber production projects and would not suffer any effects from timber activities in the future. So, plan components influence whether a project is needed, where the project would occur, how much timber production would occur, the types of timber harvest conducted, and also the manner in which timber harvest must be conducted to protect resources. Therefore, the overlap of land allocations with wildlife habitat is one of the best indicators for the activities and effects that the habitat is expected to receive.

The Nez Perce-Clearwater identified the habitat models that would be used for the analysis. The Forest Service considered peer reviewed models available, including the models of Copeland et al. (2010), as well as Inman et al. (2012b). The Nez Perce Clearwater also considered a composite model of the Copeland and Inman models identified by the Idaho Fish and Game in their wolverine plan (2014) as well. We selected the Inman (2013) model as the basis for spatial analysis because they used a resource selection function based on radio marked wolverines in the Western US to predict habitat suitable for survival, reproduction, and dispersal. As such the Inman (2012a) models are more refined than the Copeland model and have been used across Region 1 for wolverine effects analysis. The Inman models makes possible an analysis on the effects of the proposed action on primary wolverine habitat, and female maternal habitat, which provides more biological relevance of the effects of the proposed action, especially on the more limited and more biologically important wolverine maternal habitat. Also, we selected the Inman models because they were used in the Wolverine Species Status Assessment (U.S. Department of the Interior 2018b) produced by the FWS to evaluate the status of the wolverine. The composite model identified by the Idaho wolverine plan (2014) is similar to Inman's the female dispersal habitat. Effects from the proposed action include the land allocations and their associated suitability of uses, particularly how they relate to the threats identified by the USFWS as identified above (five factor analysis) (U.S. Department of the Interior and U.S. Department of Commerce 2013). The analysis also evaluates the effects of plan components on wolverines.

The analysis area for indirect effects of the revised forest plan is the administrative boundary of the Nez Perce-Clearwater. Because wolverines are wide-ranging, the analysis of cumulative effects is discussed in the context of modeled wolverine habitat within the areas surrounding the Nez Perce-Clearwater National Forest. The indirect effect of the proposed action is most influenced by the overlap of land allocations with wolverine habitat and in particular maternal habitat.

The proposed action allocates lands of various types including recommended as wilderness, suitable wild and scenic rivers, lands managed for multiple uses, proposed research natural areas, and geographic areas. The plan sets the plan components that will apply to these lands, and also sets the plan components that apply to designated lands like designated wilderness, designated wild and scenic rivers, established research natural areas, and Idaho Roadless Rule Areas. The plan components associated with these lands would direct or prohibit a number of activities common on Forest Service lands. The plan also establishes the suitability of motorized uses through the allocation of summer and winter Recreation Opportunity Spectrum settings and the suitability of timber harvest through timber suitability. Thus, a key indicator is the overlap and amount of wolverine habitat contained within the various land allocations.

The revised forest plan also contains plan components such as desired conditions, goals, objectives, and restrictions in the form of standards and guidelines. Plan desired conditions set the conditions that are desired and directs future management to achieve those conditions. Plan objectives are the actions expected to be taken to achieve desired conditions. Plan standards and guidelines are restrictions imposed on activities or actions. They are often meant to protect resources, establish which methods should not be use, or establish restrictions need to achieve desired conditions. Plan components provide the direction that every project must be consistent with in order to move forward. Plan components not only direct the actions that take place when developing projects, they also in many ways direct the types of projects and the amount of those activities that would be expected to occur in order to achieve the plan desired conditions. Activities for one resource use can often come at the expense of another resources. Therefore, plan components can have either beneficial effects or impacts to resources like wildlife. In addition to land allocations, plan components are evaluated and analyzed as to their effects specific to the biological and ecological aspects of the wolverine. The effects of plan components are evaluated specific to the unique biological and ecological requirements or vulnerabilities of the wolverine.

Coarse-filter ecosystem plan components were designed to provide for ecosystem integrity and provide the diversity and abundance of most wildlife in the plan area. Many of the coarse filter, ecosystem plan components are evaluated as to whether they would provide for wolverines. Key stressors on lands surrounding the Nez Perce-Clearwater National Forest and are discussed in the section on cumulative effects to the wolverine. There are no species-specific plan components in the proposed plan for wolverine. The direction in coarse filter ecosystem plan components are analyzed as to how they would guide forest management.

Land Allocations

The revised forest planning area is broadly divided into three management areas with similar management. Management area 1 is composed of lands designated by congress with high levels of protection. Land under this broader management area includes designated wilderness direction, designated wild and scenic river direction and direction for the National Historic Landmark. Management Area 2 includes management of Idaho Roadless Rule and areas that are proposed for designation such as Recommended Wilderness, Research Natural Areas and eligible and suitable wild and scenic rivers. Management Area 2 has a range of protective measures but can generally be characterized as moderate amounts of protections. Management Areas 1 and 2 are discussed in more detail below.

Perhaps, of the most relative importance in terms of potential impacts is the distribution of Management Area 3. Management Area 3 are lands managed for multiple uses and thus this is the management area that is most likely to experience a wide array of human activities and uses. A wide variety of activities like timber production, motorized uses, snow mobile use, recreation, and more will occur within Management Area 3. These will affect relatively little of the wolverine habitat within the plan area. The table below shows the amounts and percentage of primary wolverine habitat that is distributed within the three broad management areas. Since only 7.4 percent of wolverine habitat is within Management Area 3, only that amount will experience the most intense effects of human disturbance, dispersed recreational activities, infrastructure development, road development, and has the most access related to trapping. The other land allocations are protected to various degrees and are not expected to experience as many or as much of these types of activities as explained further below. Of more importance, most maternal habitat also is contained within protective land allocations and management.

Table 126. The distribution of Modeled wolverine Primary Habitat under the proposed action compared to the Existing Condition

Management Area	Existing Condition Acres of Modeled Primary wolverine habitat within in corresponding management areas within the 1987 plans	Existing Condition Percent of Modeled Primary wolverine habitat within corresponding Management areas within the 1987 plans	Proposed Action Acres of Modeled Primary Wolverine Habitat	Percent of Modeled primary wolverine habitat
MA1	623,830	46.76%	623,830	46.76%
MA2	616,921	46.24%	616,525	46.21%
MA3	93,487	7.01%	93,883	7.04%

Table 127 The acres of modeled maternal wolverine habitat within various land allocations.

Land Allocation Type	Acres of Modeled Maternal Wolverine Habitat	Percentage of the Total amount of Maternal Habitat
Management Area 2- Idaho Roadless Rule	409,205	54.3
Management Area 2- Research Natural Area	3,202	Less than 1%
Management Area 1-Designated Wild and Scenic Rivers	2	Less than 1%
Management Area 2- Suitable Wild and Scenic Rivers	7,538	1
Management Area 1- Designated Wilderness	303,982	40.3
Management Area 2- Recommended Wilderness	83401	11
Management Area 3-General Forest Managed for Multiple Uses	35,036	4.6

Note: Total wolverine maternal habitat equals 753,576 acres. The amounts add up to more than the total because several land management allocations overlap. For example, Recommended wilderness overlaps with Idaho Roadless Rule Area. Also, Research Natural Areas, and some Suitable Wild and Scenic Rivers overlap wilderness areas, recommended wilderness or Idaho Roadless Rule Areas.

Designated wilderness

Land allocations would support key ecosystem characteristics for wolverines because about 44.7 percent of modeled primary wolverine habitat, along with 40.3 percent of modeled maternal wolverine habitat is in designated wilderness. Plan direction for wilderness management emphasizes managing for wilderness character. In wilderness, the risk of human disturbance is low because motorized uses and mechanized transport, such as snowmobiling, helicopter-assisted skiing or snowboarding, and snow bikes, are not allowed. Plan direction for the recommended wilderness would have beneficial effects for wolverine.

The majority of the modeled habitat occurs in designated wilderness areas or in Idaho Roadless Rule areas. On the Nez Perce-Clearwater, about 597,017 acres of modeled primary wolverine habitat and 303,982 acres of maternal habitat is in designated wilderness where motorized uses, including snowmobiling, helicopter-assisted skiing or snowboarding, and track steer-assisted skiing or snowboarding, are not suitable uses and thus would not be allowed. Nonmotorized uses, such as backcountry skiing, are not restricted in wilderness or recommended wilderness. However, it is also difficult to access for nonmotorized winter recreation because much of the wilderness area on the Nez Perce-Clearwater is large and remote and access points are limited. Wilderness areas provide habitat where the risk of human disturbance to wolverines is very low during the time period when females have dependent young. The management direction within wilderness prevents or reduces threats from human disturbance, dispersed recreational activities, infrastructure, transportation corridors, land management (except prescribed burning), and reduces access to trapping. They also provide connectivity to conserve effects of small populations and genetic diversity.

Table 128. The acres of modeled primary and maternal wolverine habitat within designated wilderness within the Nez Perce-Clearwater National Forest.

Wilderness Name	Primary Wolverine Habitat Acres	Maternal Wolverine Habitat Acres
Frank Church-River of No Return Wilderness	23,894	8
Gospel-Hump Wilderness	48,539	358
Selway-Bitterroot Wilderness	524,630	303,616
Total	597,063	303,982

Idaho Roadless Rule Area Management

Also, approximately 54.3% of modeled maternal habitat is within Idaho Roadless Rule areas of which 20.3 percent (or 83,401 acres) are also recommended wilderness. The amount of modeled wolverine habitat by Roadless Rule area theme is displayed in table 129. Idaho Roadless Rule areas restrict some management activities, such as road building, vegetation management, and some mineral activities. These land allocations would protect wolverine habitat from experiencing these types of activities. Winter motorized recreation is a suitable use within Idaho Roadless Rule Areas unless they are also within recommended wilderness. Non-motorized winter recreation is also suitable within Idaho Roadless Rule Areas. The effects of winter recreation include displacement, avoidance behavior and disturbance effects, but does not typically result in mortality. Thus, about half of the wolverine habitat within the plan area would be subject to the effects of winter recreation. However, many areas where wolverine habitat is suitable for motorized winter recreation is steep or has forested vegetation which reduces or eliminates motorized recreation, which provides refuge areas from this activity. Plan direction for Idaho Roadless Rule Areas would contribute to the conservation of wolverine and their habitats and provide the ecological conditions for wolverines.

The extent of the Idaho Roadless Rule areas will not change under the proposed action and management activities disallowed under the Idaho Roadless Rule will continue to be prohibited. The Idaho Roadless Rule area themes are not going to change under the proposed action with one small exception. In cases where Idaho Roadless Rule areas are recommended wilderness, and where the Idaho Roadless Rule theme is not Wildland Recreation, the forest would petition the Idaho Roadless Rule commission to change the theme to the more restrictive Wildland Recreation Theme.

Table 129. Acres of modeled primary and maternal wolverine habitat within Idaho Roadless Rule areas by roadless rule area theme.

Idaho Roadless Rule Area Theme	Acres of Modeled Primary Wolverine Habitat	Acres of Modeled Maternal Wolverine Habitat
Backcountry Restoration	299,809	205,795
Land Management Plan Special Area	2,347	1,648
Primitive	130,711	77,097
Special Area of Historic or Tribal Significance	18,006	10,090
Wild Land Recreation	183,507	114,535
Grand Total	634,380	409,205

Idaho Roadless Rule areas direction reduces or prevents infrastructure as it addresses some type of mining, transportation corridors (prohibits road building), and land management (constrains timber harvest). Because road construction is constrained, access is constrained which as well reduces some human disturbances, and access to trapping. Thus, a little more than half of the wolverine habitat has some protections against some of these activities. These restrictions are enforced by suitability plan components (see forest plan suitability tables in the Appendix of the BA for the specific restrictions and allowances for Idaho Roadless Rule Areas). The recommended wilderness areas discussed below are also Idaho Roadless Rule areas as they overlap. Thus, in some Idaho roadless rule areas are additionally protected by the constraints present in recommended wilderness as discussed below. Approximately 47.5 percent (634,380 acres) of modeled primary wolverine habitat falls within Idaho Roadless Rule areas.

Recommended Wilderness

Of the 47.5 percent (634,380 acres) of modeled primary wolverine habitat in Idaho Roadless Rule Areas, there are about 140,761 acres (22.1 percent of acres in roadless rule) are rerecommended wilderness. A total of 83,401 acres of acres of modeled maternal wolverine habitat occurs within recommended wilderness under the proposed action. Winter motorized recreation is generally allowed in Idaho Roadless Rule areas but not in recommended wilderness or designated wilderness. Recommended Wilderness areas are nearly as protective as wildness areas. They constrain most of the same types of activities that wilderness areas constrain. Within Recommended wilderness, wolverine habitats would be protected from motorized winter recreation and access to non-motorized winter recreation is limited by distance. Recommended wilderness would provide good protection against disturbance. About 51.3 percent of maternal habitat is within either designated wilderness or recommended wilderness combined. In addition, about 634,451 acres of modeled primary wolverine habitat and 409,205 acres of modeled maternal wolverine habitat is in Idaho Roadless Rule areas where suitability plan components constrain road building and timber harvest.

Table 130 and table 131 shows the acres of primary and maternal wolverine habitat in recommended wilderness under the 1987 plans compared to the proposed action. The proposed action includes about 10.5 percent of primary habitat and about 11.1 percent of maternal wolverine habitat as recommended wilderness. Even though the amount of recommended wilderness increases under the proposed action, the amount of wolverine habitat within recommended wilderness decreases on account of a boundary change in the Hoodoo and Mallard Larkin recommended wilderness areas and because North Fork Spruces-White sand and Sneakfoot Meadows will no longer be considered recommended wilderness. The addition of the Meadow Creek recommended wilderness does not add much modeled primary and maternal wolverine habitat. The Hoodoo recommended wilderness area contributes the most acres of maternal wolverine habitat of the recommended wilderness areas. The overall change represents about 21,549 acres less of primary habitat, and 24,842 acres of maternal habitat that won’t be recommended wilderness. However, modeled wolverine dispersal habitat within recommended wilderness will increase because most of the Meadow Creek Recommended Wilderness Area is female wolverine dispersal habitat. More modeled female maternal habitat in recommended wilderness would better conserve the wolverine because these areas would receive greater protection against development and human disturbances, such as winter recreation.

Suitability plan components identify a number of activities that are not suitable (and thus not allowed) within recommended wilderness (see suitability table in the Recommended Wilderness Section of the Revised Forest Plan in the Appendix of the BA). Recommended wilderness management is only slightly less restrictive than designated wilderness management. This type of management would protect wolverines from disturbance and habitat impacts within recommended wilderness. Recommended wilderness management protects wolverine habitat from many human disturbances, dispersed recreation activities (except those accessed by foot or stock), transportation corridors, and land management activities (except prescribed fire). They also reduce the access to trapping and conserves connectivity to assist with effects of small populations.

The Proposed Action is slightly less protective of wolverine habitat compared to the existing condition because of a reduction in the amount of wolverine habitat contained within recommended wilderness. This difference is relatively minor however when considered within the context of the whole amount of wolverine habitat within the plan area that falls within a protected land allocation. Allocations of recommended wilderness were in part informed and influence by the distribution of wolverine habitat.

Areas that were formerly recommended wilderness, and that will no longer be recommended wilderness such as the reduction in the Hoodoo recommended wilderness area, will still be managed as Idaho Roadless rule areas within the Wildland recreation theme. The change resulted in approximately 13,747 acres less primary wolverine habitat, and 12,131 fewer acres of maternal habitat within the Hoodoo recommended wilderness area. The reduction amounts to about 1% of the total primary wolverine habitat, and about 1.6% of the total maternal wolverine habitat within the plan area. While they will no longer be recommended wilderness, they will be managed as Idaho Roadless Rule Wildland Recreation theme, the most restrictive theme of the Idaho Roadless Rule. The primary difference between recommended wilderness and Idaho Roadless Rule wildland recreation theme areas is suitability of winter motorized travel. Former Hoodoo Recommended wilderness areas would be within Semi-Primitive Motorized settings and would be suitable for winter motorized uses. Summer motorized uses would be constrained by MA2-SUIT-IRA-03 which specifies that roads are suitable in these areas only under strict conditions specified in the Idaho Roadless Rule where they areas are mapped as Semi-Primitive Non-motorized in the Summer Recreation Opportunity Spectrum settings. Therefore, summer motorized uses would not be suitability in these formerly recommended wilderness areas. Specific effects from this change are that future travel planning projects might open these areas to winter motorized uses, and if so, wolverines could experience disturbance and displacement because of winter motorized recreation in these areas. Furthermore, if winter motorized uses are authorized there in the future, allowing winter motorized access in these areas potentially increases the chance of illegal winter motorized uses by the public in adjacent recommended wilderness. However, the public use of adjacent recommended wilderness areas for winter motorized uses is not authorized and restrictions on this illegal use will be reduced through law enforcement. More details on the effects of winter motorized uses are included in the section on the Summer and Winter Recreation Opportunity Spectrum of the Wolverine analysis below.

Table 130. The acres of modeled primary wolverine habitat within recommended wilderness in the existing condition compared to the proposed action.

Recommended Wilderness Name	Existing Condition	Proposed Action
Hoodoo	94,345	80,598
Mallard-Larkins	49,143	51,651
Meadow Creek	Not recommended wilderness	8512
North Fork Spruce - White Sand	9,358	Not Recommended Wilderness
Sneakfoot Meadows	9,465	Not Recommended Wilderness
Grand Total	162,310	140,761

Table 131. The acres of modeled maternal wolverine habitat within recommended wilderness under the 1987 forest plans and the proposed action or revised forest plan.

Recommended Wilderness Name	Existing Condition Acres of Maternal Habitat	Proposed Action Acres of Maternal Habitat
Hoodoo	58,565	46,434
Mallard-Larkins	35,841	36,951
Meadow Creek	Not Recommended Wilderness	17
North Fork Spruce - White Sand	5,975	Not Recommended Wilderness
Sneakfoot Meadows	7,862	Not Recommended Wilderness
Grand Total	108,243	83,401

Designated, Suitable and Eligible Wild and Scenic River Management

Designated, eligible, and suitable wild and scenic rivers do not overlap much with wolverine habitat. Several suitable wild and scenic rivers have wolverine habitat within the river corridor, which is a quarter mile. For example, only 106 acres of primary wolverine habitat located within designated wild and scenic river corridors. The proposed action includes is about 15,904 acres of modeled primary wolverine habitat and 7,538 acres of modeled maternal wolverine habitat within river corridors. Plan direction within applied to designated, eligible and suitable wild and scenic rivers would indirectly benefit wolverines. For example, desired conditions within river corridors is to retain the free flowing characteristics, water quality and outstandingly remarkable values. Suitability plan direction for wild and scenic rivers identifies a suite of actions that are and are not suitable within the different Wild and Scenic River classifications. These provide some protections against some activities within the river corridor. Plan direction for the wild and scenic rivers section would have beneficial effects for wolverines.

Table 132 shows the amount of modeled wolverine habitat within suitable wild and scenic river corridors under the proposed action. Depending upon whether they are classified as wild or scenic, they would receive a level of protection from road and trail construction that could have protections on their habitat.

Rivers found suitable under the Proposed Action would protect about 1.1 percent of modeled primary wolverine habitat and about 1 percent of modeled wolverine maternal habitat. Most of the rivers considered for suitability lay within Idaho Roadless Rule areas or designated wilderness areas so the protections are only slightly better than the surrounding landscape for wolverine habitat.

Table 132 The acres of modeled maternal and primary wolverine habitat within Eligible and Suitable Wild and Scenic River classification.

Eligible and Suitable Wild and Scenic River Classification	Acres of Modeled Maternal Wolverine Habitat	Acres of Modeled Maternal Wolverine Habitat
Recreational	80	475
Scenic	2,377	3,587
Wild	5,082	11,842
Grand Total	7,538	15,904

Summer and Winter Recreation Opportunity Spectrum

Winter and Summer Recreation Opportunity Spectrum settings are a land allocation established in the Recreation section of the plan as a suitability plan component. Winter and Summer ROS establish where winter and summer motorized uses are suitable. While suitability of motorized uses is determined for multiple land allocations, motorized suitability was consistent with each of the land allocation's prevailing direction. For example, under the proposed action, approximately 140,761 acres of primary wolverine habitat, and 83,401 acres of maternal wolverine habitat occur within recommended wilderness, which are all currently also wildland recreation theme Idaho roadless rule areas and are not suitable for motorized uses. These acres represent about 10.5 percent of primary wolverine habitat and about 11% of maternal habitat in the plan area. There is little difference in management for recommended wilderness management compared to designated wilderness management. These numbers would be additional to the 40.3 percent of maternal wolverine habitat and 44.7 percent of modeled primary wolverine habitat in designated wilderness. Thus, 51.3 percent of modeled maternal wolverine habitat and 55.2 percent of modeled primary wolverine habitat in the plan area would be in a non-motorized setting because it is protected by recommended wilderness or designated wilderness. Wilderness is highly protected from Human disturbance except by foot or stock use, dispersed recreation, infrastructure, transportation corridors, and most land management activities. Thus, as much as 51.3% of all wolverine habitat in the forest would be managed with this protective mechanism.

The tables below identify how much wolverine habitat falls within the different Summer and Winter ROS Settings (Table 133, Table 134, Table 135, Table 136, and Table 137). The motorized settings are Semi-primitive motorized, Roaded Natural, and Rural, while the Primitive and Semi-Primitive non-motorized settings are non-motorized. Note that the distribution of winter and Summer ROS Settings differ. Under the proposed action, motorized over-snow travel would be suitable in approximately 39.4 percent of modeled primary wolverine habitat, 41.9 percent of modeled wolverine maternal habitat, and 51.2 percent of modeled female wolverine dispersal habitat. Note that 60.6 percent of primary habitat, 58.1 percent of maternal habitat and 48.8 percent of female dispersal habitat are non-motorized in the Winter ROS settings.

Table 133. The acres of modeled primary, maternal and female dispersal habitat within the different Summer Recreation Opportunity Spectrum Settings in the proposed action compared to the existing condition.

Summer Recreation Opportunity Spectrum Setting	Existing Condition Acres of Modeled Primary Wolverine Habitat	Existing Condition Acres of Modeled Maternal Wolverine Habitat	Existing Condition Acres of Modeled Female Dispersal Wolverine Habitat	Proposed Action Acres of Modeled Primary Wolverine Habitat	Proposed Action Acres of Modeled Maternal Wolverine Habitat	Proposed Action Acres of Modeled Female Dispersal Habitat
Primitive	560,867	317,270	869,306	597,017	303,982	1,089,458

Summer Recreation Opportunity Spectrum Setting	Existing Condition Acres of Modeled Primary Wolverine Habitat	Existing Condition Acres of Modeled Maternal Wolverine Habitat	Existing Condition Acres of Modeled Female Dispersal Wolverine Habitat	Proposed Action Acres of Modeled Primary Wolverine Habitat	Proposed Action Acres of Modeled Maternal Wolverine Habitat	Proposed Action Acres of Modeled Female Dispersal Habitat
Semi Primitive Non-Motorize	528,963	302,370	1,233,522	339,087	211,509	585,783
Semi-Primitive Motorized	181,790	112,904	579,462	322,803	212,407	835,836
Roaded Natural	62,618	21,032	341,489	73,918	25,676	491,639
Rural	0	0	355	1,413	2	21,418

Table 134. The percent of modeled primary, maternal and female dispersal habitat within the different Recreation Opportunity Spectrum Settings in the proposed action compared to the existing condition.

Summer Recreation Opportunity Spectrum Setting	Existing Condition Percent of Modeled Primary Wolverine Habitat	Existing Condition Percent of Modeled Maternal Wolverine Habitat	Existing Condition Percent of Modeled Female Dispersal Wolverine Habitat	Proposed Action Percent of Modeled Primary Wolverine Habitat	Proposed Action Percent of Modeled Maternal Wolverine Habitat	Proposed Action Percent of Modeled Female Dispersal Habitat
Primitive	42.04	42.10	28.75	44.75	40.34	36.03
Semi Primitive Non-Motorize	39.65	40.12	40.79	25.41	28.07	19.37
Semi-Primitive Motorized	13.63	14.98	19.16	24.19	28.19	27.64
Roaded Natural	4.69	2.79	11.29	5.54	3.41	16.26
Rural	0	0	0.01	0.11	<0.01	0.71

Table 135. The acres of modeled primary, maternal and female dispersal habitat within the different Winter Recreation Opportunity Spectrum Settings in the proposed action compared to the existing condition.

Winter Recreation Opportunity Spectrum Setting	Existing Condition Acres of Modeled Primary Wolverine Habitat	Existing Condition Acres of Modeled Maternal Wolverine Habitat	Existing Condition Acres of Modeled Female Dispersal Wolverine Habitat	Proposed Action Acres of Modeled Primary Wolverine Habitat Acres	Proposed Action Acres of Modeled Maternal Wolverine Habitat Acres	Proposed Action Acres of Modeled Female Dispersal Wolverine Habitat Acres
Primitive	589,022	333,065	950,662	597,017	303,982	1,089,458
Semi-Primitive Non-Motorize	520,843	301,230	1,242,476	211,543	133,742	385,532
Semi-Primitive Motorized	139,793	88,634	411,878	520,673	315,362	1,457,300
Roaded Natural	84,579	30,647	418,996	5004	490	91,669
Rural	0	0	123	0	0	0

Table 136. The acres of modeled primary, maternal and female dispersal habitat within motorized vs non-motorized winter Recreation Opportunity Spectrum Settings in the proposed action compared to the existing condition.

Motorized or Non-motorized Winter Recreation Opportunity Spectrum	Existing Condition Acres of Modeled Primary Wolverine Habitat	Existing Condition Acres of Modeled Maternal Wolverine Habitat	Existing Condition Acres of Modeled Female Dispersal Habitat	Proposed Action Acres of Primary Wolverine Habitat	Proposed Action Acres of Maternal Wolverine Habitat	Proposed Action Acres of Modeled Wolverine Dispersal Habitat
Motorized	224,372	119,281	830,997	525,677	315,852	1,548,969
Non-Motorized	1,109,865	634,295	2,193,138	808,560	437,724	1,474,990

Table 137. The forest wide percent of modeled primary, maternal and female dispersal habitat within motorized vs non-motorized winter Recreation Opportunity Spectrum Settings in the proposed action compared to the existing condition.

Motorized or Non-motorized Winter Recreation Opportunity Spectrum	Existing Condition Percent of Total Primary Wolverine Habitat	Existing Condition Percent of Total Maternal Wolverine Habitat	Existing Condition Percent of Total Wolverine Dispersal Habitat	Proposed Action Percent of Total Primary Wolverine Habitat	Proposed Action Percent of Total Maternal Wolverine Habitat	Proposed Action Percent of Total Wolverine Dispersal Habitat
Motorized	16.8	15.8	72.5	39.4	41.9	51.2
Non-Motorized	83.1	84.1	27.5	60.6	58.1	48.8

The plan does not authorize any new motorized routes but identifies the areas that are suitable for such uses. Summer Recreation Opportunity spectrum settings identify where motorized roads or trails could or could not be developed in the future. Thus, summer motorized settings are areas where new roads or trails are possible and these areas are also where motorized roads and trails would be likely to occur, but where, when are not yet determined. Areas suitable for motorized uses after the plan is finalized would allow travel plan decisions or projects to authorize motorized uses in those areas after a site-specific analysis. Areas not suitable for motorized uses are areas where roads and trails will not be allowed to be developed. Some areas, like Idaho Roadless Rule Areas, road construction is generally prohibited except under limited exceptions and so roads could be considered conditionally suitable if they are within a motorized setting. Motorized trails are not prohibited within Idaho Roadless Rule Areas and would be allowed if they are also consistent with all other direction in the plan.

Winter Recreation Opportunity Spectrum settings identify where motorized uses are a suitable use or not in the winter. Winter motorized settings are areas where winter motorized uses are suitable and are places where motorized winter recreation would probably be authorized following a site-specific travel planning decision. Areas in a non-motorized winter ROS setting would not be allowed to have winter motorized uses. The areas not suitable for winter motorized uses include designated wilderness and recommended wilderness. Winter motorized recreation is likely to be more impactful to wolverines than summer motorized uses. It should be noted that winter recreation is currently allowed in all but designated and recommended wilderness areas. It should also be noted that suitablility plan components, such as those that use winter and summer Recreation Opportunity Spectrum Settings to identify motorizsed suitability, are a new type of plan component authorized in the 2012 Planning Rule and were not used in the 1987 forest plans to establish where activities are suitable. In the past, travel on national forest lands were open unless designated closed, and many travel routes were established by repeated use, or through individual projects. Closures occurred when the Forest Service designated areas closed to vehicle travel in site specific closure orders. The Clearwater Travel Plan (U.S. Department of Agriculture 2017) established the travel system on the Clearwater National Forest which changed the route system to one of closed unless designated open. It also closed over snow motor vehicle travel within recommended wilderness areas but allowed it to continue in all other areas within the Clearwater National Forest Boundary. The Nez Perce National Forest has not undergone travel planning yet and so many areas are open to cross country travel unless designated closed. Areas designated closed include the designated wilderness areas, and several individual routes or areas closed with a variety of individual decisions. Furthermore, a wide number of summer routes are closed seasonally on both the Nez Perce and Clearwater National Forest.

In order to estimate where over-snow motorized travel is probable or likely to occur, areas likely to have a higher probability of use spatially were modeled in an ARC GIS. The modeling was based upon findings from Olson et al. (2017). In their study, winter recreationalists volunteered to carry GPS while snowmobiling or participating in winter non-motorized recreation in Colorado. Statistics were used to identify selection of remotely sensed environmental characteristics, including topography, vegetation, climate, and road access, that were selected by winter recreationalists, such as snowmobilers and backcountry skiers.

Olson et al. (2017) found that snowmobilers selected areas with greater forest road densities, lower canopy cover, and smoother, less steep terrain. Olson modeled these areas on the Nez Perce-Clearwater using parameters from her study in Colorado. To validate the models, the Forest Plan Revision team met with Forest Service staff who had on-the-ground expertise of where snowmobile use occurs on the forest and used data such as spatial data for groomed routes and roads layers. The Forest Plan Revision team was also provided with information from winter motorized user groups about where their members use areas on the landscape. This information was used to verify whether the models reasonably predict snowmobile recreation in the plan area.

In both Idaho Roadless Rule Areas and even in general forest, actual use by winter recreationalist or winter motorized users is likely less than where it is allowed because of vegetation characteristics, slope, terrain, and access from passable roads in the winter. The analysis and plan draw from several sources of information to evaluate the effects of winter recreation on wolverines. Actual winter use was estimated by a combination of information provided by winter motorized user groups, the distribution of groomed routes, and geospatial modeling that estimated the probability of winter recreation use based upon the preferences of winter recreators studied in Colorado (Olson et al. 2017). In Olson's study, the variables that predicted snowmobile use included topography, access, vegetation, and climate.

In order to better understand the probability of winter recreation use, the Rocky Mountain Research Station modeled the probability of use on the Nez Perce-Clearwater, using similar methods used in Olson et al. (2017). The values of the environmental covariates on the Nez Perce-Clearwater were sometimes far outside of the mean and range of the values that went into the Colorado model. That means that applying the model here was beyond the range of what it was trained on, and this can create unreliable predictions. In order to account for this, several models were produced and then validated. Two versions of the snowmobile models were created and two were created for backcountry skiing, one in which the covariates were standardized similar to Colorado and one in which they were standardized relative to the range of conditions on the Nez Perce-Clearwater. Standardizing is basically just a common modeling step which includes subtracting the mean and dividing by the standard deviation so that all the covariates are put into a similar scale.

Lucretia Olson created the following models for the plan area: a backcountry skiing model standardized to Colorado conditions, a backcountry skiing model standardized to Idaho conditions, an on-roads snowmobile model standardized to Colorado conditions, an on-roads snowmobile model standardized to Idaho conditions, an off-road snowmobile model standardized to Colorado conditions, and an off-road model standardized to Idaho conditions. All covariates were standardized by subtracting the mean and dividing by the standard deviation. In order to determine which model was the best fit for recreation on the Nez Perce-Clearwater, a team of Forest Service recreation specialists from each zone with on-the-ground knowledge of snowmobile and back country skiing use was assembled to evaluate the models. As part of that exercise, spatial data was used to further evaluate the models. The data used included groomed routes, maps of the plan area, and data provided by recreation groups on where they go. The model identified as the best fit in the North and Central Zones was the Idaho Standard off-road model. This model was also the best fit to the user data provided by snowmobile user groups. However, specialists felt the model over projected snowmobile areas in the South Zone. The specialists felt the Idaho Standard backcountry skiing model was the best fit for backcountry skiing in the plan area but that some known groomed routes were not showing in the model.

These models suggest variability in the probability of snowmobile and back country skiing use at any given location. These are probabilistic models that represent only the relative probability of use. The models only account for the area that has the terrain and access features that would promote use and does not represent administrative decisions about where that use is allowed. For example, some areas in the Selway-Bitterroot Wilderness were identified but motorized over-snow use is not allowed. The models represent a smaller footprint of where snowmobile use has a high probability of occurrence than where snowmobile use is allowed. Under the Proposed Action most roadless rule and general forest areas are suitable for motorized winter recreation. In reality, lower elevation areas and areas with steep slopes are shown in the model as having a low probability of use even though they are technically open to that use. Similarly, areas with heavy tree cover show a low probability of use. There could be some variability in the model predictions for various users. Highly skilled users might be able to use areas of lower model values, whereas average users might be more constrained. The dodel is displayed in figure 54.

Some precautions are in order about the application and interpretation of these models to the Nez Perce-Clearwater. First, Olson et al. (2017) developed the parameters of the winter recreation models in Colorado where conditions and use patterns may differ from those in on the Nez Perce-Clearwater. In developing the models, Olson used the mean and standard deviation from Colorado in order to make the conditions similar to what the model expected, or the mean and standard deviation from Idaho in order to allow for the differences in environmental conditions there. These models were developed for snowmobiles and backcountry skiing but do not predict winter motorized use on machines like snow bikes. It should be noted that, in Colorado, the model was validated statistically with GPS snow tracks of actual use. The validation of Nez Perce-Clearwater models used expert opinion and polygons provided by the user groups that were delineated onto maps and then transferred to an electronic format. These validation methods are not likely as robust as those generated from statistical methods. Since this is a "relative" probability that means that inference cannot be applied from the actual predicted number, meaning a value of 0.5 does NOT mean a 50 percent probability. Because of this, the predictions were binned into 10 equal area intervals, which means that 10 percent of the area is in each bin. That way, a location in bin 1 is known to be in the lowest 10th percentile of probabilities (i.e., 'bad' rec habitat), while a location in bin 10 is in the highest 10th percentile of probabilities ('good' rec habitat). Depending upon where the breakpoints are, the model can over project or under project actual use. Models would have to be created and evaluated with actual use data in order to identify a threshold probability at which use is not preferred. The best way to interpret the model is that the areas with the highest percentiles likely are the easiest or most enjoyable to use, or the most accessible, while those in lower bins might be interpreted as more difficult or unpleasant to use, or where there is little access. The model does not predict use intensity or actual use in the plan area. It only predicts where people might want to go based on the model parameters such as terrain characteristics and vegetation characteristics. The model could be useful for a variety of purposes, including understanding the effects on users when areas are found unsuitable for winter recreational uses, understanding areas where there might be user conflicts, identifying new areas that could provide winter recreation, identifying areas that could be improved by management for winter recreation, or, as in this case, understanding the potential effects of recreation on resources, such as wildlife habitat.

The models were used as a guide or a piece of information to consider, but they were not used alone to determine potential effects. Other sources of information included snowmobile user data; wildlife habitat models; administrative boundaries, such as those from recommended wilderness; the presence of known groomed routes or use areas; the presence of roads and trails; and other information. It is likely that areas predicted to be higher probability winter recreation use areas could be constrained by topographic barriers that preclude use, even when predicted to have high relative probabilities by the model.

In areas open to motorized over-snow vehicle use, the amount of use has likely increased over the last few decades due to technical advances in motorized over-snow vehicles and human population growth. However, this has not been quantified nor have the effects wolverine been quantified. Backcountry skiing has also increased in popularity.

The areas with higher probability of use based on spatial data matched up well with use information provided by Forest Service staff and user groups. Many other areas of the Nez Perce-Clearwater had low predicted probability of use because of the higher amounts of canopy cover, steep or broken terrain, or lack of roads. The percent or amount of area with these characteristics represent a smaller portion of the plan area than where these activities are technically allowed. Areas that had a higher probability of use in modeled wolverine habitat include the area near Lolo Pass and some portions of areas near the Gospel-Hump. Most other areas had a low probability of use by snowmobilers. These models do not apply to snow bikes that have an easier time navigating through trees.

While suitable, the forest has characteristics that naturally limit motorized over-snow travel or make it more difficult, such as heavy forest cover, steep terrain and limited parking access in winter. Therefore, many areas have a lower probability of snowmobile use while technically suitable. Even if identified as suitable, a site-specific travel management decision would need to be made to allow these uses. The main point of the models is to show that while motorized uses are currently allowed everywhere except wilderness and recommended wilderness, and would be suitable in the most of the plan area, snowmobile use doesn't occur everywhere it is technically allowed. It demonstrates that some spatial separation occurs because of terrain features, vegetation, and limitations in access.

Heinemeyer et al. (2017) studied the response of wolverines to winter recreation in in Idaho, Wyoming, and Montana. In that study, wolverines avoided areas of both motorized and non-motorized winter recreation with off-road recreation, eliciting a stronger response than road-based recreation. Female wolverines exhibited stronger avoidance of off-road motorized winter recreation and experienced higher indirect habitat loss than male wolverines. Wolverines showed negative functional responses to the level of recreation exposure within the home range, with female wolverines showing the strongest functional response to motorized winter recreation. Hienemeyer et al. (2017) suggested indirect habitat loss, particularly to females, could be of concern in areas with higher recreation levels. They speculated that the potential for backcountry winter recreation to affect wolverines may increase under climate change if reduced snow pack concentrates winter recreationists and wolverines in the remaining areas of persistent snow cover (Heinemeyer et al. 2017). These findings suggest that the amount of female wolverine maternal habitat affected by the alternatives could have meaningful consequences to the conservation of the wolverine on the Nez Perce-Clearwater.

Winter and Summer Recreation Opportunity spectrum settings in the plan would allow motorized uses in areas the Forest but a substantial portion of wolverine habitat is not suitable for motorized uses and are thus protected from this disturbance. Thus, dispersed recreational disturbances impact some areas while other areas are protected. The winter and summer ROS allocations also address threats from transportation corridors in areas not suitable for motorized uses. See suitability plan components for Winter and Summer Recreation Settings in the Recreation Section of the Forest plan in the Appendix Below. Also see the related suitability plan components for wilderness, recommended wilderness, research natural areas, the National Historic Landmark and Idaho Roadless Rule.

Research Natural Areas

Research natural areas are managed to provide a reference area for scientific study. Thus, many activities that affect wolverines are constrained there. While wolverine habitat is limited, these areas provide some protections against the threats and stressors identified above. The table below shows the amount of primary wolverine habitat that is protected by research natural areas.

Table 138. The acres of modeled primary wolverine habitat and the percent of forest wide modeled primary wolverine habitat.

Designated Research Natural Area	Acres of modeled primary wolverine habitat within Designated Natural Research Areas	Percent of Modeled Primary Wolverine Habitat
Bald Mountain RNA	369	0.03%
Elk Creek RNA	950	0.07%
Fish Lake RNA	119	0.01%
Grave Peak RNA	379	0.03%
Sneakfoot Meadows RNA	1946	0.15%
Square Mountain Creek RNA	471	0.04%
Steep Lakes RNA	797	0.06%
Total	5031	Less than 1%

Connectivity

Connectivity has been identified as an important facet to wolverine conservation (Schwartz et al. 2009, Idaho Department of Fish and Game 2014). The proposed action supports connectivity well because wolverine habitat is relatively well distributed along the Eastern portion of the forest, including the Idaho-Montana border (figure 57, figure 58 and Figure 59). The proposed action protects this connectivity via the protected land allocation such as recommended wilderness, designated wilderness, and Idaho Roadless Rule areas.

As noted above, the important areas for connectivity on the Nez Perce-Clearwater are along the Idaho-Montana border. Other areas that are important for connectivity are along the ridges above the Salmon River between Sabe Creek and MacKay Bar. The area above the Salmon River is already designated wilderness.

While recommended wilderness provides the greatest amount of protection, the management under the Idaho Roadless Rule would also keep these lands relatively free from motorized uses, which can cause of loss of connectivity. The amount of modeled female wolverine dispersal habitat is shown in the table below.

The recommended wilderness areas, combined with designated wilderness areas, include most of the areas in the Nez Perce-Clearwater identified by Schwartz et al. (2009) as important to wolverine connectivity, save for the checkerboard area near Lolo Pass. This area appears to be an important connectivity area for lynx, fisher, and wolverine. Plan components would apply to decisions on national forest lands within this area, but the Forest Service does not have control of private lands in this area. Forest lands in the checkerboard ownership area are identified as Management Area 3 and managed for multiple uses. The revised forest plan contains a FW-DC-LND-01 which encourages acquisition of lands important to at risk species.

Summary of Land allocations

Combined, land allocations provide the majority of wolverine habitat with some protections against a number of threats. The combined amounts of wolverine habitat that falls within lands with at least some protections are shown in the table below. In total approximately 95percent of modeled maternal habitat, which is the most important, has some protections afforded by either Idaho Roadless Rule, Designated Wilderness, Designated Wild and Scenic Rivers, eligible or suitable Wild and Scenic Rivers, or Research Natural Areas. Only approximately 35,036 out of 753,576 acres of modeled wolverine maternal habitat occurs within in Management Area 3 managed for multiple uses (Table 127) while 718,540 acres occurs within one or more of the protected land allocations. Additionally, 89.6 percent of modeled dispersal habitat falls within a protective land allocation, which provides for connectivity as shown in Table 139. These protective land allocations address most of the threats described above. These areas combine to provide connectivity and ecological conditions to conserve wolverines.

Table 139. The amounts of modeled female wolverine dispersal habitat within different protective land allocations in the revised forest plan.

Land Type	Acres of Modeled Female Dispersal Habitat	Percent of Forest wide Modeled Female wolverine Dispersal Habitat
Designated Wilderness	1,089,458	36.0
Recommended Wilderness	253,051	8.4
Research Natural Areas	19,580	0.6
Idaho Roadless Rule Areas	1,347,458	44.6
Total	2,709,547	89.6

Effects of Plan Components

Many land management activities are thought to have minimal impacts to wolverines. This analysis focuses on the aspects of land management that were evaluated and identified as a threat or stressor within the Wolverine Species Status Assessment (2018b) produced by the U.S. Fish and Wildlife Service.

Terrestrial Ecosystem Plan Components

The Proposed Action includes plan components designed to maintain or restore diverse, resilient vegetation conditions that would provide for wolverines and their prey species. The effects of vegetation treatments have little consequences for wolverines, except to their prey. Wolverines eat a wide variety of prey, including large ungulates like moose, caribou, and mountain goats, and a variety of small and medium sized mammals. Ungulates benefit from more early seral vegetation so alternatives with more vegetation management would benefit wolverine prey.

Desired conditions FW-DC-TE-01, FW-DC-TE-05, and FW-DC-TE-06 would contribute to ecosystem integrity and provide a diversity of habitat conditions for wolverine prey.

Plan direction for the forestlands section proposes desired conditions that suggest changes to dominance types, size classes, and forest density and addresses landscape pattern. Plan components in this section are informed by modeling of the natural range of variability so should contribute to ecosystem integrity. The effects would be to provide for the diversity and abundance of habitats that would support wolverine prey. However, these plan components would direct management to alter some habitats that would be used by wolverines and wolverine prey. Alteration of these habitats would be through timber production or harvest, prescribed fire, wildfire managed to achieve land management plan objectives, planting, mechanical vegetation management, and other forestry or restoration methods after site-specific analysis. Since wolverines tend to use high elevation habitats, forested habitats used most by wolverines would be within the cold and cool moist broad potential vegetation types. Wolverines also cross through lower elevation habitats so plan direction for all broad potential vegetation types might be affected. However, as analyzed above, wolverines appear to be affected only temporarily by timber activities, prescribed fire, and other methods of vegetation manipulation. The U.S. Fish and Wildlife Service (2013d) stated:

“Few effects to wolverines from land management actions such as grazing, timber harvest, and prescribed fire have been documented. Wolverines in British Columbia used recently logged areas in the summer and moose winter ranges for foraging (Krebs et al. 2007). Males did not appear to be influenced strongly by the presence of roadless areas (Krebs et al. 2007). In Idaho, wolverines used recently burned areas despite the loss of canopy cover (Copeland 1996).

Intensive management activities such as timber harvest and prescribed fire do occur in wolverine habitat; however, for the most part, wolverine habitat tends to be located at high elevations and in rugged topography that is unsuitable for intensive timber management. Wolverines are not thought to be dependent on specific vegetation or habitat features that might be manipulated by land management activities, nor is there evidence to suggest that land management activities are a threat to the conservation of the species.

Therefore, while plan components for Forested lands would direct management to alter forest vegetation near and within wolverine habitat, they would not likely have negative environmental consequences to wolverines. Moreover, they would provide a diversity of plant and animal communities that would provide prey for wolverines.

Plan direction in the meadows, grasslands, and shrublands section of the revised forest plan would have beneficial effects on wolverines. Desired conditions within this section would contribute to healthy non-forested habitat and ecosystem integrity to provide a diversity of habitat conditions for wolverine prey.

Fire management plan components provide a framework for the management of wildfire and fuels. This direction would allow and encourage fire across the planning area. Fire is likely to play a dominant role in shaping wolverine habitat over the life of the plan. Wolverines appear tolerant of changes due to fire. For example, wolverines use recently burned areas despite the loss of canopy cover (U.S. Department of the Interior 2013d). Increased early seral conditions across wolverine habitat should provide improved nutritional conditions for, such as ungulates. Plan direction for wildland fire would have beneficial consequences for wolverines over the long term.

Plan components for Water and Aquatic Ecosystems, Riparian Management Zones, Conservation Watershed Network, Infrastructure (aquatic and riparian), Energy and Minerals (aquatic and riparian), Livestock grazing (aquatic and riparian) would protect and conserve aquatic habitat. Plan direction in the water and aquatic ecosystems section would have beneficial effects on wolverines because they would restore, enhance, and protect aquatic ecosystems. Wolverines are known to eat beavers occasionally and these habitats would provide for them. Wolverines would not be sensitive to restoration activities and would benefit from proper functioning aquatic habitats.

Plan direction in the wildlife section of the plan would have beneficial effects on wolverines. FW-DC-WL-01 would provide conditions for federally listed species in the event wolverine become listed. FW-DC-WL-03, FW-DC-WL-06, FW-DC-WL-09and FW-GDL-WL-01 would promote connectivity for wolverines. FW-GDL-WL-01 address some threats from infrastructure. FW-STD-WL-01 requires that the Nez Perce-Clearwater follow the Northern Rockies Lynx Management Direction. Lynx habitat overlaps with wolverine habitat and would contribute beneficial consequences to wolverine habitats.

Plan direction in the multiple uses' wildlife section would have negligible effects on wolverines and would benefit wolverine prey. These plan components are designed to create conditions that benefit wildlife like deer elk and furbearers, which serve as pray for wolverines.

Plan direction for the sustainable recreation section may lead to management that could increase disturbance to wolverines. Specifically, wolverines have been shown to avoid winter recreation, and plan direction for recreation may affect the amount and distribution of recreational activities. FW-DC-REC-11 could facilitate additional future winter recreation into wolverine habitat. Some activities suitable in the Proposed Action under the recreation opportunities spectrum may allow motorized winter disturbance in wolverine habitat and could displace wolverines because of avoidance behavior. Recreation infrastructure, such as trails, may increase access for trapping activities, which could result in limited incidental take; however, incidental trapping of wolverine is rare (U.S. Department of the Interior 2018b). While these activities could result in temporary displacement, and in some cases longer term displacement, they would rarely lead to mortality and are not likely to results in population declines. The best scientific information available does not substantiate recreational activities as a threat to wolverine (U.S. Department of the Interior 2013g). Therefore, the dispersed recreational activities in the proposed action are not considered a threat to the DPS of the North American wolverine.

Plan direction for the infrastructure section may lead to management that would increase disturbance to wolverines. These plan components mostly direct the condition and maintenance of facilities, road and airstrips. Specifically, this direction could encourage increased road access into wolverine habitat, which could alter wolverine habitat. It is unlikely the limited amount of access would have population level effects on wolverines. Recreation infrastructure, such as roads, may increase access for trapping activities, which could result in limited incidental trapping; however, incidental trapping of wolverines is rare. Wolverine trapping is not legal in Idaho and wolverines are only affected by non-target, incidental trapping. Wolverines may be involved in vehicle strikes that could result in mortality, but road strikes are uncommon on highways (U.S. Department of the Interior 2018b). Wolverines are assumed to have lower mortality on slower speed, gravel forest roads. The plan does not authorize any roads, facilities or other infrastructure. Instead, it provides the guidance by which those features are managed and maintained. New infrastructure would only authorized after a site specific analysis. Few new buildings are anticipated within the life of the plan. The USFWS (U.S. Department of the Interior 2013d) concluded that actions related to infrastructure maintenance and developments are not a threat to the DPS of the North American wolverine.

Plan direction in the land ownership and land uses section would have both negative and beneficial consequences on wolverines. FW-DC-LND-01, specifically, would direct land acquisitions to prioritize habitat for at-risk species, which would have beneficial consequences for wolverine connectivity and habitat conservation. On the other hand, FS-DC-LND-06 could facilitate some impacts to wolverine habitat from energy developments. However, a large portion of the wolverine habitat is in designated wilderness where these facilities would not be allowed. Potential for oil or gas extraction is low to very low on the Nez Perce-Clearwater so there would be little chance to have oil and gas extraction projects. Wind energy potential is also low so there is less likely to be wind energy development. More likely the types of project would be Rights of Way for electrical grid, or oil and pipelines could occur. These types of infrastructure usually have temporary impacts during construction but then would have low impacts after completion. The footprint would be limited to only very a small percent of wolverine habitat in the plan area. Therefore, the impacts would be negligible. This plan direction is not a threat to the DSP of the North American Wolverine.

Plan direction for the ecosystem services section would potentially have consequences to wolverines. Specifically, FW-GDL-ES-01 would direct the Nez Perce-Clearwater to consider or provide alternative access when closing roads. In many areas of the Nez Perce-Clearwater, road densities are high or very high and may need to be reduced due to resource concerns. In the event that happens, new motorized access would be required to be provided. In some cases, this guideline would create a situation where new motorized access is constructed when other motorized access is closed. This guideline also applies to winter motorized uses. If winter areas are close to motorized uses, new motorized access in winter would also need to be opened.

Scrafford et al. (2018) showed that top winter and summer models indicated that wolverines avoided and increased their rate of movements near roads. Wolverine movement, but not avoidance, increased with traffic volume. Roads, regardless of traffic volume, reduce the quality of wolverine habitats, and higher-traffic roads might be most deleterious. Krebs et al. (2010) also showed a response to roads. Roaded and recently logged areas were negatively associated with female wolverines in summer. Roads are also well known to affect wolverine prey, such as elk. This plan component might also redistribute winter motorized uses into new areas in the event of closures elsewhere. While this plan guideline would not create additional motorized access, it could redistribute it. The best scientific information available does not substantiate recreational activities as a threat to wolverine (U.S. Department of the Interior 2013d). Therefore, the dispersed recreational activities like motorized access are not considered a threat to the DPS of the North American wolverine.

Plan direction for the timber section guide how timber harvest and production are to be conducted to ensure they are sustainable. The timber section of the plan also identifies the areas that are and are not suitable for timber harvest. Objectives indicate the amount of timber that would be produced annually. Timber harvest would alter some wolverine habitats mostly in Management Area 3 and a limited amount within Management Area 2. However, wolverines are not sensitive to vegetation management and will continue to use those areas. Therefore, there would be negligible consequences for wolverines from timber plan direction. Most of the areas suitable for timber production are within Management Area 3, which contains 93,487 acres of modeled primary wolverine habitat, and 35,024 acres of modeled maternal habitat. These acres represent about seven percent of primary habitat and about 4.6 percent of modeled maternal wolverine habitat. Timber production is not suitable in the rest of the Forest. Timber harvest for other resources objectives is suitable within Idaho Roadless Rule Areas and would occur mostly from existing roads. These areas and represents a small proportion of wolverine habitat in the plan area. Wolverines are not thought to be dependent on specific vegetation or habitat features that might be manipulated by land management activities (U.S. Department of the Interior 2013d), therefore the land management activities like timber harvest are not considered a threat to the DPS of the North American wolverine.

Plan components for the energy and minerals section are designed to be consistent with laws that govern mining on public lands. These activities may have some environmental consequences to wolverine habitats if mining or energy extraction activities take place in wolverine habitat under the plan. In the event they do, it would result in temporary or permanent loss of wolverine habitat. However, the extent of mining or mineral activities would likely be over only a small proportion of wolverine habitat. Wolverine habitat within designated wilderness and designated wild and scenic rivers would not be subject to the effects from mining as mineral rights were withdrawn except for mineral activities that were present at the time of designation. Thus, no new mineral activities are expected in those areas which is on nearly half of the wolverine habitat in the plan area. The proposed actions related to infrastructure maintenance and developments are not a threat to the DPS of the North American wolverine.

Plan direction for the livestock grazing section direct how livestock grazing is to be conducted on forest lands so that it is conducted sustainably. These are authorized through a permit process. Most of the livestock allotments are distributed outside of wolverine habitats, and wilderness areas do not allow new livestock allotments to be established. Therefore, wilderness areas are mostly protected from this activity. The effects of this plan direction would potentially have negligible environmental consequences for wolverine. Land management activities like livestock grazing are not considered a threat to the DPS of the North American wolverine.

Cumulative Effects

Cumulative effects are the actions by state, tribal, local agencies or governments that are reasonably likely to occur within the project area. The cumulative effects focus on activities identified by the U.S. Fish and Wildlife Service's (2018b) Species Status Assessment for Wolverine. The threats they identified included roads and infrastructure, recreational activities and associated human disturbances, trapping, wildland fire, disease and predation, and overutilization. The area for the cumulative effects analysis includes the plan area and the areas immediately surrounding the Nez Perce-Clearwater National Forest.

Lands managed by the State of Idaho include areas adjacent to the Nez Perce-Clearwater. These lands are administered by the Idaho Department of Lands and are managed to provide endowment funds for education. Activities that occur on those lands include forestry, mining, recreation (including motorized recreation and hunting and trapping), and grazing. Forestry practices on Idaho Department of Lands are conducted in a manner to ensure that the health of forest soil, water, vegetation, wildlife, and aquatic habitat is maintained during the growing and harvesting of forest trees in Idaho. Only limited amounts of state land contain wolverine dispersal habitat and even fewer areas contain primary habitat. Thus, state lands contribute mostly to dispersal habitat. Thus, cumulative adverse effects to the wolverine are not expected as a result of management actions on state lands.

The Idaho Department of Fish and Game manages hunting, trapping, and fishing statewide including on the Nez Perce-Clearwater National Forest and adjacent federal, state and private lands through the issuing of hunting permits. Additionally, they enforce laws related to hunting, trapping and fishing. Trapping or hunting of wolverine is illegal in the State of Idaho, however, efforts by trappers to capture other furbearers has the potential to capture wolverine as a non-target species in rare instances. The trapping of wolverine has been shown to be a rare event. In cases where it has occurred, it has sometimes resulted in a wolverine death but in other instances wolverine are set free. The amount of incidental trapping is not thought to reduce population of wolverines, though some individuals could get trapped incidentally in the future. The state requires trappers to undergo trapper education in order to help them avoid incidentally trapping a wolverine. Trapping is an activity that is expected to continue on the Nez Perce-Clearwater National Forest as time goes on but is not expected to result in cumulative effects that would substantially reduce the population of wolverines.

The Idaho Fish and Game prioritized wolverine conservation in their wolverine conservation plan (Idaho Department of Fish and Game 2014). They identified areas with wolverine habitat as Tier I, Tier 2, and Tier3, where Tier I receives the highest priority. Most areas on the Nez Perce-Clearwater were identified as Tier II or Tier III areas. They stated that many areas in the state were not ranked as Tier I due to permanent protections provided by wilderness and roadless designations, which limit potential threats. The Idaho management plan for the Conservation of Wolverines in Idaho identifies seven objectives for actions that would help conserve wolverines. These objectives help address concerns about threats to wolverines and would not be inconsistent with the Revised Forest Plan. The Management Plan for the Conservation of Wolverines in Idaho (2014) is not expected to result in cumulative effects on wolverines.

The Idaho Department of Fish and Game issues permits allowing live capture, handling, and release of wolverines for scientific studies, which usually involved log box-traps that do not cause physical injury to the captured animals (Idaho Department of Fish and Game 2014). The agency also issues scientific collection permits to various agencies and organizations and to IDFG biologists that can include the capture, chemical immobilization, and placement of radio-collars/radio-markers on wolverines (Idaho Department of Fish and Game 2014). These permittees (and IDFG staff) are required to comply with animal trapping and handling protocols approved by IDFG's Wildlife Health/Forensic Laboratory and other animal welfare and research institutions. These activities are not expected to result over exploitation of wolverines.

The state of Idaho requires winter motorized vehicles to be registered and issues stickers to use winter motorized vehicles. Winter motorized vehicle use will continue on both Nez Perce-Clearwater National Forest and adjacent public or state lands. Access during the winter season may indirectly affect the area accessible for trapping. Any cumulative effects to the wolverine resulting from trapping in relation to winter recreation access on the Nez Perce-Clearwater and surrounding lands are not available at this time. However, incidental trapping of wolverines are a rare event in Idaho as evident from data (Idaho Department of Fish and Game 2014) and, in many cases, the wolverine can be released alive. Some wolverines may cross from the Nez Perce-Clearwater into Montana where wolverines are considered a furbearer with a closed season. The State of Idaho will continue to issue registrations for the use of winter motorized vehicles and use by these vehicles are expected to continue on the Nez Perce-Clearwater National Forest. Winter motorized recreation rarely causes mortality to wolverines, but wolverines can experience displacement and disturbance effects from winter motorized uses. This activity by the State is not expected to substantially reduce the population of wolverines.

County governments operate within the Nez Perce-Clearwater National Forest. Counties included in the Plan area include Clearwater County, Lewis County, Idaho County Shoshone County, and is adjacent to Adams County. County Governments consult and coordinate with the Forest Service on Forest Service and County activities. They also provide a wide range of human services. County governments enforce laws, collect taxes, issue drivers licenses, and regulate electricity, water, waste disposal, and sewage. County government activities are not expected to result in cumulative effects to wolverines.

Some roads that cross the Forest are administered by other local, county or state agencies. For example, Highways 12 and 14 are administered by the Idaho Department of Transportation. Roads administered by other local, state, or other federal agencies will continue to exist and be managed after the Forest Plan is completed. Vehicle strikes are unlikely to occur on National Forest System roads, which are traveled at slower speeds and have lighter traffic volumes than highways because most of them are gravel or native surface roads. Comparatively few paved roadways traverse through the Nez Perce-Clearwater and most don't cross through wolverine habitat. Two highways transverse east and west through the Nez Perce-Clearwater National Forest. The longest paved roadways include Highway 12 along the Lochsa River, the Salmon River Road, portions of the Selway River Road, and Highway 14 along the Southfork Clearwater River. Other paved roadways include Highway 8 and Highway 3 through limited portions of the Palouse District and a few other portions of paved roads that end shortly after entering National Forest lands. Highway 12 and Highway 14 allow traffic speeds between 45 to 50 miles per hour so it may be possible on rare occasions for a dispersing wolverine to be struck by a moving vehicle on these roads. Perhaps the most significant impact to wolverine habitat connectivity is where Highway 12 crosses Lolo Pass. The paved highways mentioned above mostly travel in areas outside modeled wolverine habitat at lower elevations. For example, most of highway 12 runs along the Lochsa and Clearwater rivers at low elevation outside of wolverine habitat except for where it climbs in elevation near Lolo Pass. Similarly, highway 14 travels along the South Fork of the Clearwater River and does not cross through wolverine habitat. Therefore, very little wolverine habitat has paved roads running through it within the plan area. Most roads in wolverine habitat are lower speed, low traffic volume gravel or natural substrate roads that are less likely to cause vehicle strikes. Additionally, these roads have comparatively low traffic volumes. There are no major roadways that travel north to south in the plan area. Few, if any, wolverine are known to have been killed on the paved roads in the plan area. Using the Nature Serve method for evaluating threats, the magnitude of the threat from these paved highways are estimated to be low because the scope of the impacts from roads is small because these paved roads only travel through a limited portion of the wolverine habitat, and the severity is slight because it is not expected to impact more than 10 percent of the wolverine population during the life of the plan. Major highways are not abundant in the plan area and most of them do not cross through modeled wolverine habitat.

Outside of the Nez Perce Clearwater there are more highways which could impact connectivity. In Montana, Highway 93 and I-90 may affect wolverine dispersal and gene flow, as well as developments in western Montana. I-90 may also represent a barrier to connectivity from wolverines in Canada. These roads currently represent only minor impacts to connectivity because of their limited distribution in wolverine habitat. The Nez Perce-Clearwater is a largely intact block of land with few higher speed roads and provides connectivity and remote locations for wolverines. Squires et al. (2007) concluded that wolverine movements are unpredictable and are not easy to incorporate in the planning of structural highway mitigation projects. The highways and roads administered by other federal agencies are expected to result in displacement, and in rare cases could result in vehicle strikes of wolverines. However, they are not expected to substantially reduce the population of wolverines.

Some Native American tribal governments have treaty reserved rights associated with treaties between the U. S. Government and Tribal Nations. These treaties guarantee tribal members various rights. The Nez Perce-Clearwater national Forest was part of the ancestral homeland for the Nez Perce Tribe. Treaty rights guaranteed to the Nez Perce tribe including the right to fish at usual and accustomed fishing stations, and to hunt, gather and graze livestock on open and unclaimed lands. These activities remain ongoing and would continue after the forest plan is completed. These activities would not result in a substantial population decline or a loss of habitat for wolverines. They would not result in cumulative effects.

Wolverines are a highly wide-ranging species. Recent research in Glacier National Park has demonstrated that habitat connectivity from Glacier National Park to Canada currently provides for wolverine movement (Copeland and Yates 2006).

Plan components provide for connectivity of wolverine habitat. The natural range of variation for persistent spring snowpack on the Nez Perce-Clearwater is unknown but variation from year to year is common. High-elevation areas with persistent spring snow at least five years out of seven are more likely to retain snow as the climate changes; whereas lower-elevation areas that retain persistent spring snow only one year out of seven are more likely to lose snow in the future as the climate changes. The Nez Perce-Clearwater provides approximately 753,576 acres of modeled wolverine maternal habitat, 1,334,238 acres of modeled primary wolverine habitat, and 3,024,135 acre of female dispersal habitat available to wolverines that is remote and difficult to access by any means during the time periods when wolverines may be sensitive to disturbance.

Conclusions and Determination

The revised forest plan does not implement any physical changes on the ground and so all effects of the plan are indirect. The forest plan provides the direction that would direct future actions that could potentially affect wolverines or their habitat in the future. The Forest Service recognizes that some of the activities listed in the proposed action have the potential to affect individual wolverines and/or their habitat, but not to the level of jeopardizing the continued existence of the wolverine.

The North American wolverine occupies the Nez Perce-Clearwater National Forest, and the Forest provides roughly 10 percent of the wolverine habitat within Region 1 of the Forest. Approximately half of the wolverine habitat in the plan area lies within the most restrictive land management allocation within Designated Wilderness, or recommended wilderness. Furthermore, a little more than about 89 percent of wolverine habitat combined falls within land allocations that offer some mechanisms (suitability of uses) that restrict a number of activities identified as one of the four threat factors identified for listing (U.S. Department of the Interior 2013b).

The revised forest plan establishes land allocations and the associated direction to establish the prevailing management of those lands. Some lands are established in the plan to emphasize multiple uses, while other lands are allocated to emphasize conservation of resources, maintain roadless character, maintain wilderness character, or protect rivers. Land allocations are similar to zoning, because they identify where a variety of activities are suitable. Land allocations include the identification of lands recommended to congress for consideration as designated wilderness, rivers eligible or suitable for wild and scenic river designation, the identification of research natural areas, and establish management areas or geographic areas. The revised forest plan also sets the direction for the management of designated wild and scenic rivers, and designated wilderness areas. In addition, the plan establishes timber suitability, where motorized uses are suitable in both summer and winter. Plan components associated with land allocations, such as suitability plan components, influence where roads could be constructed, where recreational activities like winter motorized uses could occur, or where timber production or harvest could occur.

The majority of wolverine habitat occurs within land allocations that provide different degrees of protection. The majority of wolverine primary, maternal habitat falls within either designated wilderness, Idaho Roadless Rule Areas or Recommended wilderness. These land allocations and associated management and suitability of uses afford the wolverine habitat protections against many activities. For example, nearly all impactful activities are constrained or restricted in designated and recommended wilderness. While Idaho Roadless Rule Areas find more activities suitable, they constrain road construction, vegetation management and some mineral extraction and these activities are expected to occur at lower levels than general forest management.

In their summary regarding climate change, the USFWS reported that the best scientific and commercial information available indicates that only the projected decrease and fragmentation of wolverine habitat or range due to future climate change is a threat to the species now and into the future. Perhaps the most impactful activity that the plan finds as a suitable use is the establishment of motorized recreation, and in particular for wolverines, the establishment of where winter motorized uses are suitable. Winter motorizes recreation has been shown to displace wolverines and wolverines exhibit avoidance behavior of areas of sustained winter recreation. However, these effects are not expected to result in mortality. Winter recreation activities be concentrated more into wolverine habitat as the amount of snow present decreases. Therefore, could interact with climate change. However, spring snow is expected to be present well past the life of the forest plan (approximately 15 years).

The plan also establishes forest wide direction including desired conditions, objectives, and restrictions such as standards or guidelines designed to protect natural resources or provide for sustainable use of resources. The implementation of the plan could lead to projects or activities that could affect the wolverine or their habitat. The plan directs a number of activities that fall within the categories of threat that the U.S Fish and Wildlife Service identified as their five factors to list the American Wolverine. The listing decision determined that the activities the Forest Service would conduct under the direction of the revised forest plan do not pose a threat to the wolverine as they concluded that the best available scientific information does not indicate that potential stressors such as land management, recreation, infrastructure development and transportation corridors pose a threat to the DPS (U.S. Department of the Interior 2013b). It is recognized that project activities may have a negative impact on individual wolverines and/or their habitat, but not to the point where the species, existence is jeopardized. Because the Forest Plan would not reduce the reproduction, numbers, or distribution of the American Wolverine in the wild, it is the Forest Service's opinion that the level of adverse effects of actions that will be potentially conducted under the plan is not reasonably expected to reduce appreciably the likelihood of both the survival and recovery of the wolverine and that the effects of the Forest Plan on wolverines are not likely to jeopardize the continued existence of the species.

Plant Species Assessment

Species federally listed as threatened or endangered, proposed, and candidate are listed by the United States Department of the Interior U.S. Fish and Wildlife Service (FWS). Under provisions of the Endangered Species Act of 1973, federal agencies are directed to conserve endangered and threatened species and to ensure that actions authorized, funded, or carried out by these agencies are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of their critical habitats. These species are automatically considered “at-risk” species under the 2012 Planning Rule.

Two threatened species, Spalding’s catchfly (*Silene spaldingii*), and whitebark pine (*Pinus albicaulis*), are known to occur on the Forest and are the subject of this analysis.

An additional species, water howellia (*Howellia aquatilis*) was dropped from federal listing as threatened under the Endangered Species Act by the U.S Fish and Wildlife Service (1994) on June 16, 2021 (U.S. Department of the Interior 2021b). This species was analyzed throughout the forest planning process and included in early drafts of analysis and the biological assessment; however, water howellia is not carried forward in the final analysis.

Spalding’s catchfly

Status and distribution

On October 10, 2001, the FWS published the final rule to list Spalding’s catchfly as a threatened species (66 FR 51597). Critical habitat has not been designated for this species.

The recovery plan for Spalding’s catchfly was completed in 2007 (72 FR 58111) outlines the recovery strategy, recovery goals, objectives, and delisting criteria. The objective of the recovery program is to recover Spalding’s catchfly by protecting and maintaining reproducing, self-sustaining populations in each of the five distinct physiographic regions where it resides, with the ultimate goal of delisting the species.

Spalding’s catchfly is endemic to the Palouse region of southeastern Washington and adjacent Oregon and Idaho, and is disjunct in northwestern Montana and British Columbia, Canada. Spalding’s catchfly is found predominantly in the Pacific Northwest bunchgrass grasslands and sagebrush-steppe, and occasionally in open-canopy pine stands. Populations are often small and isolated with a relatively few holding the majority of the range wide population. Forty-nine occurrences are known from Idaho (U.S. Department of the Interior 2020a), mostly in the canyon grasslands with a few on the Palouse Prairie of the west central portion of the state. There are three occurrences on lands administered by the Nez Perce-Clearwater. A range wide study by Lesica (2016) found the occurrences on the Nez Perce-Clearwater to be genetically unique from all other occurrences.

Massive range-wide loss of habitat for Spalding’s catchfly is due to a combination of the conversion of habitat to intensive agriculture and the degradation of the remaining habitat, primarily by weed invasion. The fragmentation of habitat has left small, genetically isolated populations scattered across four states and five physiographic provinces (U.S. Department of the Interior 2007d), namely (1) the Palouse Grasslands in west-central Idaho and southeastern Washington, (2) the Channeled Scablands in east-central Washington, (3) the Blue Mountains Basins in northeastern Oregon, (4) the Canyon Grasslands along major river systems in Idaho, Oregon, and Washington, and (5) the Intermontane Valleys of northwestern Montana and British Columbia, Canada (U.S. Department of the Interior 2007d). More than half of the remaining populations are on private land, with the majority lacking regulatory control (U.S. Department of the Interior 2007d).

The Spalding's catchfly recovery plan (U.S. Department of the Interior 2007d) outlines steps to recover the plant by protecting and maintaining reproducing, self-sustaining populations so that protection under the Endangered Species Act is no longer necessary. The plan specifies the following recovery criteria (somewhat condensed):

Twenty-seven populations, with at least 500 reproducing Spalding's catchfly individuals in each and with intact habitat, occur rangewide at key conservation areas and are distributed throughout the five identified physiographic provinces as follows: five within the Blue Mountains Basins, seven within the Canyon Grasslands, eight within the Channeled Scablands, four within the Intermontane Valleys, and three within the Palouse Grasslands.

All 27 key conservation areas of Spalding's catchfly are composed of at least 80 percent native vegetation (by canopy cover), have adjacent habitat sufficient to support pollinating insects, and are not fragmented (i.e., intact; see criterion #1).

Populations of Spalding's catchfly at key conservation areas demonstrate stable or increasing population trends (less than a 10 percent chance that the population is declining) for at least 20 years. To address this criterion, consistent range-wide long-term monitoring methodologies that identify what parameters will be monitored, how, and at what frequency need to be developed.

Habitat management plans have been developed and implemented for all key conservation areas.

Invasive nonnative plants with the potential to displace Spalding's catchfly have been continually controlled or eradicated within a 100-meter (328 feet) radius of all Spalding's catchfly populations within key conservation areas.

Prescribed burning is conducted, whenever possible, to mimic historical fire regimes within a particular physiographic region in Spalding's catchfly habitat.

Seed banking occurs ex situ first at all smaller Spalding's catchfly populations (not key conservation areas or potential key conservation areas) and second at all larger Spalding's catchfly populations (key conservation areas or potential key conservation areas) to preserve the breadth of genetic material across the species' range.

A post-delisting monitoring program for the species will be developed and ready for implementation. Therefore, the recovery plan for Spalding's catchfly (recovery plan) outlines a strategy to protect and maintain reproducing, self-sustaining populations in each of the five physiographic regions where it resides to ensure the long-term persistence of the species (U.S. Department of the Interior 2007d). Within each of these regions, the FWS identifies key conservation areas (KCA) to focus conservation efforts on the larger populations that can or do support at least 500 plants, the assumed minimum viable population size. Across its range, there are approximately 125 populations of Spalding's catchfly, most of which have fewer than 100 plants; only about 23 populations' hold 100 or more individuals. The 10 largest populations are each made up of more than 500 plants and represent 75 percent of the species.

A KCA possesses the following qualities:

- Is composed of intact habitat (not fragmented), preferably 40 acres or greater.
- Native plants comprise at least 80 percent of the canopy cover of the vegetation.
- Adjacent habitat is sufficient to support pollinating insects.

- Habitat is of the quality and quantity necessary to support at least 500 reproducing individuals of Spalding's catchfly.

According to the recovery plan, KCAs should be surrounded by 300 acres of habitat that is intact or could be restored to support Spalding's catchfly. The action area analyzed here includes Spalding's catchfly occurrences in the Canyon Grasslands physiographic region.

In the Canyon Grasslands physiographic region, there are currently six Spalding's catchfly KCAs, one of which, is within the Forest Plan planning area. This KCA for Spalding's catchfly is located in the lower Salmon River Canyon on the Salmon River Ranger District and contains two subpopulations of the species, while a third occurrence is not included. Forest Service botanists surveyed the areas within the KCA and other nearby areas of potential habitat repeatedly as part of the Island Ecosystem Assessment at the Watershed Scale (EAWS) effort, numerous NEPA projects, species focused surveys and through range monitoring. Formal monitoring of the occurrences of the KCA have been ongoing since 2015.

Habitat requirements and life history

In general, Spalding's catchfly is found in open, vernally moist, mesic grassland communities or sagebrush-steppe communities. The bunchgrass grasslands where Spalding's catchfly primarily occurs are characterized by either Idaho fescue (*Festuca idahoensis*) or Idaho fescue with bluebunch wheatgrass (*Pseudoroegneria spicata*) except in Montana where the dominant bunchgrass is rough fescue (*Festuca campestris*). A Junegrass (*Koeleria macrantha*) component is also a good indicator of suitable habitat. The plant is found at elevations ranging from 1,200 to 5,300 feet (U.S. Department of the Interior 2007d), usually in deep, productive loess or loamy soils. Plants are generally found on northwest to northeast facing slopes or swales or other landscape features where soil moisture is relatively higher (Hill and Gray 2004). Soils in the Idaho, Oregon, and Washington tri-state area are loess wind-dispersed and ash from volcanic eruptions influenced (Tisdale 1986, Johnson and Simon 1987), while soils in Montana are more glacially influenced (Schassberger 1988). These mesic sites are highly productive, with total plant cover and forage dry weight sometimes three times greater than drier, more shallowly soiled bluebunch wheatgrass communities (Johnson and Simon 1987). Spalding's catchfly is found on a wide range of slopes, from flat areas to slopes as great as seventy percent. Most occurrences are found on grades ranging from twenty percent to forty percent slope (Hill and Gray 2004), although this may be an artifact of where intact habitat has not been converted to other uses.

On the Nez Perce-Clearwater National Forests, the species occurs in the Canyon Grasslands Physiographic Province. Of the five provinces in which the species occurs, this is the most intact, largely because the canyon walls are steep and do not lend themselves to agricultural or urban developments. On the Nez Perce-Clearwater, the typical elevations and aspects do not generally support grasslands. At these higher elevations (4,000 to 5,000 feet) in the Canyon Grasslands the northern slopes are inhabited by tree species and Spalding's catchfly is found on gentle southern slopes where the appropriate bunchgrass communities reside. While parts of the Canyon Grasslands are accessible and have been surveyed, much of it consists of remote, inaccessible steep slopes associated with the Salmon River Canyon, Hells Canyon, and tributaries of these basins. Because of inaccessibility and steep topography, the Canyon Grasslands overall are the most under surveyed area for Spalding's catchfly and represent the area where large populations of Spalding's catchfly may be most easily conserved because they are more removed from human influence.

Spalding's catchfly is an herbaceous, long-lived perennial in the pink family (Caryophyllaceae). Seasonal stems emerge in the spring from the root crown, sending usually one, but occasionally a second shoot 8 to 24 inches in height. Each stem has typically 4 to 7 pairs of lance-shaped leaves and 3 to 20 sizeable flowers with small greenish-white petals flowers on reproductive shoots. Stems, leaves, and the floral calyx are covered with dense sticky hairs that catch insects. The species is noted for its very long taproot that can exceed 1 meter (39 inches) and may grow up to three feet or more in length, and which can store reserves for multiple seasons until environmental conditions are conducive to flowering (Lesica 1997).

The large taproot stores water and nutrients allowing the species to remain dormant, in some cases, up to three seasons (Lesica 1999, Hill and Gray 2004). The plant's lifespan is poorly understood but may exceed 30 years in some specimens (U.S. Department of the Interior 2007d). Lesica found that most catchfly plants spend nearly half their summers in the dormant state; in a given year, depending on climatic conditions, between 10 and 70 percent of the individuals in a site could be dormant (Lesica and Montana National Heritage Program 1995, Lesica 1999). It is uncommon for an entire patch of catchfly plants to remain dormant all season, but some plants in a population are found to be dormant most seasons (Lesica and Allendorf 1995, Lesica 1999).

Spalding's catchfly begins blooming in mid to late July. Blooming continues through August and sometimes into September. Fruits mature from August until September when the plant senesces. The small, 2-milimeter, seeds are wrinkled, winged, and dispersed by wind following dehiscence of the capsule (U.S. Department of the Interior 2007d).

Spalding's catchfly reproduces solely by seed. It lacks rhizomes or other means of reproducing vegetatively (Lesica 1993). Spalding's catchfly reproduces sexually as an obligate or para-obligate out-crossing species requiring insect pollination to set viable seed (Lesica and Steele 1996). The yellow bumblebee (*Bombus fervidus*) is the main pollinator of Spalding's catchfly (Lesica 1993), (Lesica and Heidel 1996) with the white-shouldered bumble bee (*Bombus appositus*) pollinating much less often (Tubbesing et al. 2014). Dense patches of Spalding's catchfly or catchfly plants growing in areas having a high abundance of other flowering plants are more often visited by pollinators, thereby resulting in higher seed set (Taylor and DeBano 2012). Noctuid moths have also been observed visiting Spalding's catchfly (Lesica and Heidel 1996). *Silene spaldingii* appears to have only two major pollinators in the Zumwalt Prairie, of which one (*B. fervidus*) accounts for 90 percent of visits, and those pollinators appear to preferentially visit catchfly (Tubbesing et al. 2014). It is, therefore, vital to prevent *B. fervidus* and *B. appositus* populations from declining. Additionally, this study showed that dense patches of catchfly plants are disproportionately important for conservation, since they are visited more frequently by pollinators and thus probably have greater seed set and recruitment.

Existing condition

The Heritage Program Network has ranked this species as G2, Imperiled. Such species are at high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors. In Idaho, the Natural Heritage Program has ranked the species as S1 or Critically Imperiled. Such species are at very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

There are three known occurrences of Spalding's catchfly on the Nez Perce-Clearwater National Forests. These are all located in the Salmon Canyon of the Salmon River Ranger District. The total acreage of occupied habitat is approximately 40 acres. Two populations at Center Ridge and Mud Springs Ridge compose a KCA for the Canyon Grasslands physiographic region under the recovery plan, which has a total population of approximately 3,000 plants. The third occurrence at Johnson Ridge is much smaller with a little over 100 plants on less than one acre. The Center Ridge and Mud Springs KCA is monitored as outlined in the Recovery Plan.

Surveys for Spalding's catchfly have been conducted as part of project analysis for several timber sales and issuance of grazing allotments. Also, two landscape assessments including The Island EAWS effort.

Focused surveys for the species were supported by the U.S. Fish and Wildlife Service in 2017 and 2018. These efforts have resulted in virtually all of the suitable habitat on Forest ground east of the Salmon/Snake divide being surveyed, often multiple times. No additional occurrences have been found, though some apparently suitable habitat has been located.

The condition of grasslands at the three occurrences is moderate to high quality based upon relative weed occurrences and disturbance processes. The Center Ridge site has been invaded by common crupina (*Crupina vulgaris*), which is an aggressive weed infesting several thousand acres in the lower Salmon River canyon. Weed treatments away from the population are being investigated and shows promise. Volunteer efforts in 2017, 2018, and 2019 have been hand pulled this weed within the population area. The Mud Springs population is much larger in area and is generally supported by a cleaner, more intact native grassland. Crupina is present but has only lightly moved into the more mesic Idaho Fescue community that supports Spalding's catchfly. The large grassland has a significant sulfur cinquefoil (*Potentilla recta*) population, but it appears to be heavy only at the lower elevations that are mostly below the Spalding's catchfly local distribution. Annual grasses including several species of introduced brome (Bromus spp.) and Ventenata (*Ventenata dubia*) are present at all three sites. Habitats dominated by Idaho Fescue with some thatch or duff layer generally support fewer weedy species, but adjacent areas of steeper, more drained slopes with an abundance of open soils support bluebunch wheatgrass dominated communities that are much more susceptible to weed infestations. These areas continue to provide seed source to push into the Fescue dominated communities.

Grazing occurs at all three Spalding's catchfly sites. Local movement of livestock reduces most direct impacts to the species at all three sites. Livestock generally avoid the more open sites in favor of more desirable pasture grasses on easier terrain that is closer to water sources. However, some level of trampling of plants as livestock pass through population areas and soil disturbance that may promote weeds and habitat degradation does occur. The Center Ridge population is fenced to protect the species from disturbance when livestock are in the pasture early in the season. Late season and fall use results in few impacts because plants have senesced for the season. Livestock use at Mud Springs is very transitory as cows use the ridge as a transportation corridor to reach more desirable grazing and easy terrain associated with roads and the gentler divide. Formal monitoring and informal observation of forage utilization at the three populations is generally observed to be light.

Other uses include wildlife bedding and grazing. A foot trail passes below the Center Ridge site, but use is very light, and livestock appears to maintain this path. An ATV track accesses the Mud Springs occurrence, but mostly remains on the dry ridgeline that does not provide suitable Spalding's catchfly habitat. Occasional users will continue beyond the end of the road and access open grasslands where the species does occur and some impacts to the species have been noted.

Long term abundance and vigor trends for these populations are unknown, but population monitoring as directed by the recovery plan was initiated in 2015. No definite conclusions can be drawn from data at this time, but general observation appears to indicate populations are stable. The sites have been visited approximately 30 to 35 times over the past 18 years and qualitative observations over this period indicates that populations are stable with some low level of impact from livestock and incidental recreational and monitoring activities. The greatest concern for this species on the grounds administered by the Forest would be the invasion of Crupina primarily at Center Ridge.

Populations of Spalding's catchfly have been extirpated in some portions of its range and are stable in others, depending on the particular threat to each population (U.S. Department of the Interior 2007d). Due to species biology and life history, populations may vary in number from year to year. Periodic dormancy likely due to species biology and climatic conditions is common and can result in fluctuating population counts over time. As directed by the recovery plan, range wide monitoring of the species' key conservation areas will measure trends that will guide management of the species status. Monitoring methods concerning timing and frequency of measurement are designed to account for the annual variations in population counts.

Effects of the proposed action

Effects to Spalding's catchfly include habitat loss due to human development, habitat degradation associated with adverse grazing and trampling by domestic livestock and wildlife, and invasions of aggressive nonnative plants. In addition, a loss of genetic fitness, defined as the loss of genetic variability and effects of inbreeding, is a problem for many small, fragmented populations where genetic exchange is limited. Other impacts include changes in fire frequency and seasonality, prolonged drought, insect damage and disease, off-road vehicle use, and herbicide spraying and drift. In Idaho, Hill and Gray (2005) found that rodent activity appeared to be related to the mortality of Spalding's catchfly plants. In Montana, Lesica (1999) found that fire did not appear to affect recruits or adults in some years, but Hill and Gray (2005) observed that it may indirectly affect Spalding's catchfly by increasing introduced weed species. Other observations seem to indicate some disturbances such as grazing or fire may be important to the long-term persistence of this species in northwest Montana as a result of reduced competition with the larger, litter-producing native bunchgrasses, primarily rough fescue, with which it co-occurs (Lesica 1997). However, bunchgrasses in Idaho do not produce as much litter so this mechanism may not apply.

Risk Factors

Hill and Gray (2004) discusses in detail the causes of Spalding's catchfly rarity, and the current and future threats to this species in the Canyon Grasslands. The threats they noted that provide the greatest concern to the continued existence of Spalding's catchfly currently include:

- Habitat degradation from weed invasion and livestock grazing.
- Habitat loss and fragmentation and associated genetic pressures of small populations (i.e., pollinator limitation, inbreeding depression, and loss of populations).
- Alteration of fire regimes, including fire suppression, increasing fire frequencies, and out-of-season fires.
- Predation by herbivores, including domestic livestock, native ungulates, and rodents and insects.
- Herbicide drift.
- Prolonged drought and global warming.

Not all the risk factors identified by Hill and Gray (2004) are associated with management activities that potentially may occur or are ongoing with management of the forest. Thus, not all the list risk factors are further discussed below.

Livestock Grazing Risk

Livestock grazing can directly impact Spalding's catchfly by herbivory and trampling and indirectly impact Spalding's catchfly via soil compaction, soil erosion, the introduction of nonnative plants, and the loss of pollinator habitat. Grazing of Spalding's catchfly has been observed and is considered a threat to the species (Hill and Gray 2004, Taylor and Tuttle 2007). Direct herbivory removes flowers or seeds, thereby limiting reproduction. Herbivory of leaves inhibits a plant's ability to manufacture carbohydrates necessary for seasonal growth and storage in the perennial taproot. Trampling can easily break off entire plants at the ground level and damage the root crowns from which stems emerge. Root crown damage is more frequently associated with early season grazing (Hill and Gray 2004). Late summer grazing or heavy grazing is especially detrimental to Spalding's catchfly (Hill and Gray 2004).

A study by Dingledein et al. (2010)[11] found Spalding's catchfly would begin seasonal growth during late May into June as a rosette stage with foliage near the ground. By late June stem elongation and initiation of floral buds has begun. This study, conducted earlier in the season during June and into mid-July, corroborates what Forest Service botanists observe: early season grazing has little direct effect to the catchfly with few plants being browsed (Hustafa pers. comm. June 2017). This is likely due to the fact that during early season, catchfly plants are small (in the rosette stage) and largely beyond the reach of livestock that prefer to browse on the taller lush, green vegetation of the early season. However, as the season progresses, browse rates on the catchfly, from both livestock and wild ungulates, increase (Kimoto et al. 2012). In another study (Cullen et al. 2011) browse rates could not be correlated to cattle stocking rates. Their results suggested cattle did not consume significant numbers of catchfly plants during the peak summer growth period, but the authors could not conclude that grazing does no harm to populations of the plant. Dingledein et al. (2010) found significant browse of catchfly plants throughout the growth season ranging from 20 to 71 percent, although this was attributed largely to wild ungulates, because the study area was not grazed by livestock during the investigation. Sufficient research has not been completed to discern what levels of grazing may allow the Spalding's catchfly to persist (U.S. Department of the Interior 2007d). Herbivory by wildlife at Center Ridge has been observed to range from heavy to light in different years.

Indirect effects can impact the habitat of Spalding's catchfly. Disturbances, most frequently linked to adverse livestock grazing and trampling, have dramatically altered western arid ecosystems in a progression from native perennial bunchgrass communities to invasive nonnative annual grasslands that are then susceptible to more invasive perennial plant invasions (DiTomaso 2000).

Of greater concern is the impact livestock grazing may have on the pollinator community in Spalding's catchfly habitat. Kimoto et al. (2012) found that even where catchfly plants had not been fed on by livestock, grazing of habitat reduced pollinator abundance, thereby limiting seed production. Described as the first large-scale manipulative study of the effect of grazing intensity on native bee communities in a North American grassland, Kimoto (2010) found that increases in grazing intensity showed a linear decline in bee diversity, abundance, and richness, especially with bumblebees (*Bombus* spp.), which include the main pollinator of Spalding's catchfly, the yellow bumblebee (*Bombus fervidus*) (Lesica and Heidel 1996, Kimoto et al. 2012, Taylor and DeBano 2012).

In the absence of open pollination, Spalding's catchfly experienced an 85 percent reduction in fecundity and a loss of fitness, due to inbreeding depression, resulting in an estimated total reduction in fitness of 99 percent (Lesica 1993). Therefore, management practices that significantly reduce pollinators, especially bumblebees, could have a significant impact on the recruitment of new plants into a Spalding's catchfly population. Even though Spalding's catchfly is long lived, without seedling recruitment, populations would decline over time. Forage utilizations approaching 50 percent showed very little to no bumblebee abundance (Kimoto 2010). Kimoto (2010) found that even moderate grazing (22 to 40 percent utilization) led to bumblebee declines. Utilization level at the sites of the Spalding's catchfly occurrences is not measured; however, due to known local livestock movements and existing population fencing, utilization

[11] Dingeldein, J, RV Taylor, H Schmalz and V Jansen. 2010. Demography, Phenology and Predation of Spalding's Catchfly (Silene spaldingii) on the Zumwalt Prairie Preserve, 2006-2009. The Nature Conservancy of Oregon. Cited in Cullen, S., R. V. Taylor, and H. Schmalz. 2011. Do Cattle Eat Spalding's Catchfly? An Examination of Browse Rates in Grazed and Un-grazed Areas of the Zumwalt Prairie Preserve. The Nature Conservancy.

of fescue/junegrass bunchgrass habitat that supports the species is observed to be very light. Utilization of other grassland communities near water sources, shade and areas of pasture grass is much heavier as these factors are preferred by livestock.

Invasive Plants Risk

Exotic, invasive plant species threaten the viability of Spalding's catchfly. Invasive plants compete with Spalding's catchfly for water, nutrients, and light. Of greatest concern is the effect of invasive plants on seedling establishment, a vulnerable state for perennial plants. Not only are invasive species able to outgrow seedlings of Spalding's catchfly, but they also often leave behind increased leaf litter, inhibiting the germination of other plants. In one study in Washington, high levels of exotic plants (*Bromus secalinus, Hypericum perforatum*, and *Ventenata dubia*) were associated with less vigorous occurrences of Spalding's catchfly (Caplow 2002)[12]. Invasive plants also provide competition for pollinators, affecting fecundity and individual fitness in Spalding's catchfly (Lesica and Heidel 1996). Insects may switch from Spalding's catchfly to an invasive plant if it is more abundant or provides more pollen or nectar (Richards et al. 1999). Lesica and Heidel (1996) found lower visitation rates for Spalding's catchfly in sites infested with St. John's wort (*Hypericum perforatum*). While all these weeds are present at local Spalding's catchfly sites, common crupina is the greatest invasive species threat at this time.

Prescribed Fire Risk

Although the actual effects of prescribed fire are unknown, Spalding's catchfly is presumed to have evolved with and adapted to the historical fire regime in intermountain western North America (Lesica 1999), where fire has been a common occurrence in grasslands (Barrett and Arno 1982). Historical fire frequency in the Idaho fescue grasslands of the Salmon Canyon is not well understood, but it is believed that fires were frequent, with return intervals of short duration. Late summer fires are more damaging to Idaho fescue, but pre-burn cover of fescue returns usually within five years (Johnson and Swanson 2005). In the Idaho fescue grasslands, fire is not believed necessary to promote seedling establishment of Spalding's catchfly as it apparently is in the western Montana grasslands dominated by rough fescue (Lesica 1999).

Drier conditions in canyon grasslands also limit the ability of trees and shrubs to encroach onto grasslands. Therefore, prescribed fire may not be needed to maintain many such grasslands on the Forest. If prescribed fires are needed to improve habitat for Spalding's catchfly, they would likely be carried out during the early spring or fall, when fires are more easily controlled. Fires carried out in the fall would probably have less impact to Spalding's catchfly than fires carried out during spring, when it is possible seedlings could be killed. Dormant plants would probably not be affected, and older plants emerging from root crowns may suffer only minor damage. Perennial individuals damaged by spring fire are expected to send up additional shoots from axillary buds.

Portions of the Center Ridge occurrence burned in 2015. Effects on existing plants could not be assessed; however, observations in the following years seemed to indicate the fire had little effect on the population. Crupina may have increased slightly in the area after the fire, but this is uncertain as the weed was already on an increasing trend in the area.

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[12] Caplow, F. 2002. Silene spaldingii Wats. (Spalding's catchfly) field inventory and management recommendations. Washington State Department of Natural Resources, Natural Heritage Program, Olympia, Washington. Cited in Hill, J. L., and K. L. Gray. 2004. Conservation strategy for Spalding's catchfly (Silene spaldingii Wats.). U.S. Department of the Interior, Fish and Wildlife Service, Boise, ID.

Recreation

Throughout the Canyon Grasslands there are few recreational conflicts due to the general inaccessibility of the terrain. However, two of the three occurrence sites administered by the Forest do have recreational considerations. A narrow footpath crosses below the Center Ridge population. The path passes within approximately 50 feet of known plants. Considering the very narrow, often grown-in track, it appears the trail is rarely used, and livestock movement is what maintains this trail. The trail may provide some benefit to the Spalding's catchfly population as it may encourage livestock passage away from the plants themselves. No effects to the species from the existence or use of this trail have been noted after 14 years of observation.

The Mud Springs site has a user-created ATV trail that runs east - west along the main ridgeline. Most of the route is on very thin soiled, rocky ground that provides no habitat for Spalding's catchfly. However, there are multiple points along the route that provide access into the terrain of the population. This site has been visited or monitored closely for approximately ten years and effects of ATV use have been noted only once. While this activity is observed to be uncommon, the effects to the population included physical damage to several plants. Management of this unofficial trail is not addressed in the Forest Plan and would be subject to Forest-wide transportation planning and local access decisions. While use of this path is observed to be low, there is potential for impacts to Spalding's catchfly as long as access is open. Use most likely would occur late in the season for hunting purposes. During that time Spalding's catchy is senescent and would not be affected; however, there is some potential for use throughout the spring and summer.

Plan Components

Several plan components may indirectly support ecological conditions to maintain suitable habitats to contribute to the persistence of plant species of conservation concern. These are presented in more detail in the EIS. Others that more directly involve Spalding's catchfly and appropriate grassland habitats are presented here.

FW-GDL-GRZ-01 seeks to reduce impacts resulting from livestock use to benefit riparian areas, meadows, and other habitats that may be important to species of conservation concern. FW-GDL-GRZ-02 states that allotment planning should include measures to protect federally listed plant species and evaluate habitats for other at-risk species and adjust prescriptions as necessary to ensure viability. FW-GDL-GRZ-03 directs that utilization occurs at levels that will maintain vegetative vigor and community health and planning considers the condition, timing, and use of the resource along with other values of the area. This is important to maintain overall health of grassland habitats to prevent overall habitat degradation which harms at-risk species including Spalding's catchfly.

Plan components that would most benefit at-risk species through reduced weed infestation include FW-DC-INV-01, which places invasive species at less than five percent of the plant species composition across the forest and specifies that no new weed species become established. FW-OBJ-INV-01 call for treating 6,000 acres of weeds annually to contain or reduce weed density, infestation area, or occurrence with emphasis on early detection and rapid response to new invaders. FW-GDL-INV-01 seek to implement project level design features that will reduce weed establishment and expansion. There are many soil plan components that will benefit at-risk species through a reduction of soil disturbance that will offer less opportunity for weed establishment. FW-STD-ARE&M-01 requires the use of native species in revegetation efforts as part of mineral operations to prevent or reduce weed invasion. All of these components may be of particular importance in grasslands due to their higher risk of weed infestations.

FW-DC-TE-05 promotes habitat conditions in the plan area that provide ecological conditions that support a diversity of plants and provide ecosystem integrity. FW-GDL-TE-01 encourages management activities in uncommon habitats described in FW-DE-TE-02 and should be designed to conserve the habitats to allow rare and endemic species to persist. FW-DC-GS-01, FW-DC-GS-02, and FW-DE-GS-06 are particularly important for at-risk plants in the grassland guild.

Research natural areas (RNAs) contribute to ecological sustainability and biological diversity through inclusion of assigned vegetative communities as well as protection of at-risk species and unusual elements (MA1-DC-RNA-01). Such RNAs promote unusual or diverse botanical settings. Many of these contain occurrences of threatened or species of conservation concern and many good examples of at-risk plant guilds. Under the revised forest plan, an RNA at Mud Springs Ridge will be designated to provide protection for and opportunities to study Spalding's catchfly as well as increase emphasis to reducing weed occurrence to maintain that native community.

Cumulative Effects

The effects area includes lands within the proclaimed boundaries of the Nez Perce-Clearwater National Forests. Actions on adjacent nonfederal lands have a possibility to affect catchfly populations on National Forest System lands, but likely only for those populations nearest the forest boundaries. It is not possible to state what actions are likely to occur on adjacent private lands, but it is assumed these lands would be managed as they are today. Nonfederal actions most likely to affect catchfly plants on adjacent National Forest System lands involves invasive plant control on adjacent private lands, as well as county and state roads leading to and coursing through the national forests. Active weed management programs on adjacent private lands, as well state and local government roadside weed control are beneficial to catchfly habitat on federal lands because fewer weed propagules would be available for transport, whether by people, vehicles, wind, or wildlife, to disperse into catchfly habitat on the national forests. The effects of other management activities on adjacent private, state, and federal lands are expected to be confined to those lands and not overlap in time and space with catchfly populations on National Forest System lands.

Increasing Human Populations

Additional stressors that may increase in the future are increasing human population levels, both locally and nationally, with resulting increasing demands and pressures on public lands. As related to forest and vegetation conditions, these changes may lead to increased demands for commercial and non-commercial forest products, elevated importance of public lands in providing for habitat needs of species, and changing societal desires related to the mix of uses public lands should provide. The plan components are adequate to support persistence of at-risk plant populations and habitat on the Nez Perce-Clearwater as human populations and demands increase. However, population and use trends suggest not only that public land will play an increasingly important role in the conservation of these species in the future, but also that management to ensure recovery and prevention of federal listing of species will be an increasingly difficult challenge.

Adjacent Lands and Other Management Plans

Portions of the Nez Perce-Clearwater adjoin other National Forests, each having its own forest plan. The adjacent forests include the Idaho Panhandle, Lolo, Bitterroot, Salmon–Challis, Payette, and Wallowa–Whitman National Forests. Generally speaking, management of vegetation, including species of concern, is consistent across all national forests due to law, regulation, and policy. The cumulative effects would be that the management of at-risk plants and habitats would provide adequate protection to prevent species from decline or loss of persistence. The Nez Perce-Clearwater is also intermixed with lands of other ownerships that include private lands, other federal lands, and state lands.

Bureau of Land Management lands primarily to the west of the Nez Perce-Clearwater are managed by the Cottonwood field office through the 2009 Cottonwood Resource Management Plan. The plan is complementary to the Nez Perce-Clearwater Forest Plan in terms of managing for multiple uses and sustaining healthy and functional ecosystems. Broadly speaking the plan would likely contribute toward similar general desired conditions as the Nez Perce–Clearwater Forest Plan, with much of the management guidance having similar intent with respect to resource protections.

The Idaho Natural Heritage Program is a member of NatureServe, an international network of biological inventories known as natural heritage programs or conservation data centers that operate in all 50 U.S. states, Canada, Latin America, and the Caribbean. This system provides important tools that allows locations and related information on rare species to be entered and shared for environmental review and conservation purposes. Lists of rare, unique, or vulnerable plants, animals, and biological communities are maintained by each heritage program.

The State of Idaho manages timberlands to maintain income for endowment trusts in accordance with the Idaho Forest Practices Act. The Idaho Department of Lands administers the Idaho Forest Practices Act (1974) to promote active forest management and ensure that the health of forest soil, water, vegetation, wildlife, and aquatic habitats. While the State Natural Heritage Program maintains a database of species of concern, only species federally listed by the U.S. Fish and Wildlife Service have official status or management protections on state lands. While maintaining economically sustainable products, the Idaho Forest Action Plan seeks to promote forests that are diverse and resilient to changes in climate and human activities and maintain ecosystem benefits.

No at-risk plant protection is provided as part of any area county resource plans. These plans generally acknowledge the importance of special habitats such as wetlands, riparian areas, and grasslands in supporting species diversity ecosystem function, which provides a course filter benefit for all at-risk species in such habitats. At-risk plants on private lands are at greater risk of local extirpation due to lack of protections. Such county plans generally are focused on the effective control and reduction of noxious weeds. Successful efforts in weed control would contribute to the maintenance or improvement of habitats important to ecosystem function and at-risk species where they occur.

Climate Change

Climate change is expected to profoundly alter vegetation structure and composition, terrestrial ecosystem processes, and the delivery of important ecosystem services over the next century (Kerns et al. 2017). Climate influences the spatial distribution of major vegetation biomes, the abundance of species and communities within biomes, biotic interactions, and the geographic ranges of individual species. Researchers speculate that a warming climate will alter precipitation patterns, with some regions becoming drier and others becoming wetter. Within the Pacific Northwest, a recent model predicts warmer and wetter winters in 80 years. Being stationary, plants must migrate through dispersal, colonization, and recruitment strategies, a relatively slow process compared to mobile organisms. Some researchers believe that plant species will not be able to migrate at a pace dictated by a warming climate, which would isolate and eventually doom some species, unless new adaptations arise to cope with a changing environment. Under the influence of changing climate, if droughts and warmer winters continue, agents such as insects and disease will likely show increased levels of activity. Mortality from these factors and drought would likely lead to fires that burn with greater intensity when weather favorable to high intensity fires develops. Such events may further reduce potential habitats and limit ability to species to respond and migrate.

Primary strategies to address climate change threats focus on increasing resilience to ecological disturbance (wildfire, insects, and nonnative species) (Halofsky and Peterson 2016). Rare and disjunct species and communities require adaptation strategies and tactics focused on encouraging regeneration, preventing damage from disturbance, and establishing refugia. Overall, the protection and restoration objectives and practices described in the Revised Forest Plan, will potentially promote resilience and conservation.

Determination of effects

The implementation of the Forest Plan would contribute to the maintenance and restoration of habitat for Spalding's catchfly and result in a may affect, **Likely to Adversely Affect** determination.

Rationale for determination:

1. Plan components outlined above provide some protection to ameliorate the identified risks to this species ad its habitat from management activities; however, land uses, and processes will continue to be active.

2. Though many management actions, such as nonnative invasive species abatement, grazing plan adaptative management and potentially prescribed fire, would assist in the long-term recovery of Spalding's catchfly, these actions may have adverse effects that may impact individual plants or their habitat.

3. The U.S. Fish and Wildlife Service has developed a recovery plan that provides a strategy to protect and recover this species that the Forest Service in implementing.

Whitebark Pine

Status and distribution

On July 19, 2011, the U.S. Fish and Wildlife Service (FWS) published in the Federal Register (USDI 2011a) its 12-month status review finding on a petition to list whitebark pine (*Pinus albicaulis*) under the Endangered Species Act. After a review of all available scientific and commercial information, the U.S. Fish and Wildlife Service concluded that listing the species as threatened or endangered is warranted but precluded by higher priority actions. This made the species a candidate for federal listing as threatened or endangered. Following this action, the U.S. Forest Service Northern Region added whitebark pine to its sensitive species list in 2011. On December 2, 2020, the Fish and Wildlife Service published a proposed rule to list the whitebark pine as a threatened species under the Act. Following this designation, the species was included with federally listed species as part of a biological assessment and no longer treated as a sensitive species by the Forest Service. On December 15, 2022, the Service listed the whitebark pine (*Pinus albicaulis*) as threatened with 4d rule, under the Endangered Species Act (ESA). This listing rule went into effect on January 17, 2023.

The listing includes a "4(d) Rule" authorized under section 4 of the Endangered Species Act, which allows the Service to tailor the protections and prohibitions pertinent to the specific conservation needs of a threatened species. If listed, the proposed 4(d) Rule would provide protections from removal, cutting, digging up, damaging, or destroying whitebark pine on federal lands. However, the rule also includes exceptions to the general Endangered Species Act protections to allow for optimal, flexible, and adaptive management that can advance whitebark pine conservation now and in the future. Federal forest management, restoration, and research related activities are explicitly excepted. The exception covers silviculture practices and forest management activities that address fuels management, insect and disease impacts, and wildlife habitat management. These include but are not limited to cone collections; planting seedlings or sowing seeds; mechanical cuttings as a restoration tool in stands experiencing advancing succession; full or partial suppression of wildfire in whitebark pine communities; allowing wildfires to burn; survey and monitoring of tree health status.

- Because no forest management, restoration, or research-related activities are known to pose any threats to the whitebark pine in any form, the Proposed 4(d) Rule and exception covers a broad range of management activities as long as the activities are conducted or authorized by the appropriate Federal agency.
- The Proposed 4(d) Rule and the exception are intended to allow Federal land management agencies to continue managing the forest ecosystems where whitebark pine occurs and to continue conducting restoration and research activities that benefit the species.
- The Proposed 4(d) rule is not expected to limit grazing in any way.

On February 5, 2021, the Service issued conferencing recommendations for proposed federal actions that may affect whitebark pine. While many activities may affect individual trees or a small number of trees in a stand, the Fish and Wildlife Service anticipates that most Federal actions are unlikely to pose a threat to the species including, for example: recreation, grazing, road construction, utility lines, renewable energy development, campground management, special use permits, pest control, prescribed burns, and restoration activities. They conclude that most Federal actions are unlikely to affect or diminish the reproduction, numbers, or distribution of the whitebark pine.

The distribution of whitebark pine includes coastal and Rocky Mountain ranges that are connected by scattered populations in northeastern Washington and southeastern British Columbia. Occurrences are found in scattered areas of the warm, dry Great Basin but whitebark pine typically occurs on cold, windy high-elevation or high-latitude sites in western North America. As a result, many stands are geographically isolated (Arno and Hoff 1989, Keane and Parsons 2010). Extensive forests form in the northern Rocky Mountains of the United States and it is also abundant on the eastern slope of the Cascades and Coastal Ranges; however, whitebark pine assumes a patchier distribution at the northern end of its distribution in the Canadian Rockies and Coast Ranges of British Columbia (Arno and Hoff 1990). More than 90 percent of whitebark pine forests exist on public lands, including those managed by the Forest Service and the National Park Service in the United States and by provincial and federal agencies in Canada (Keane et al. 2012).

On the Nez Perce-Clearwater, whitebark pine forests characterize open, cold subalpine habitats associated with tree line in the high Bitterroots in the eastern portion of the unit, in the Gospel Hump Wilderness, the west boundary of the Slate Creek basin, and in the Seven Devils to the southwest. Other occurrences are in the Selway Crags, the Williams Range, and on the highest points west of the Selway River. Outside of these locations scattered whitebark pine are found in low numbers on only a few of the highest summits.

Habitat requirements and life history

Whitebark pine forests occur in two high mountain biophysical settings. Most common are upper subalpine sites where whitebark pine is the major seral species that is always replaced by the shade-tolerant subalpine fir (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmannii*), or mountain hemlock (*Tsuga mertensiana*), depending on geographic region (Arno and Weaver 1990). These sites support upright, closed-canopy forests and occur on favorable positions in the upper subalpine transitioning to timberline down to above or overlapping with the elevational limit of lodgepole pine (Pfister et al. 1977, Arno and Weaver 1990). On the Nez Perce-Clearwater, most whitebark pine probably occurs in this situation.

On sites where whitebark pine is the only tree species able to successfully dominate, high elevation settings are found at particularly harsh sites in the upper subalpine and at treeline on relatively dry, cold slopes where trees often occur in elfin forests, clusters, groves, or tree islands (Steele et al. 1983, Arno and Gruell 1986, Arno and Weaver 1990). Other species, such subalpine fir, Engelmann spruce, and lodgepole pine (*Pinus contorta*), can occur on these sites, but they occur as scattered individuals with truncated growth forms, and they never dominate a stand (Pfister et al. 1977, Arno and Hoff 1990, Arno and Weaver 1990, Cooper et al. 1991). Whitebark pine can also exist as krummholz in the alpine treeline ecotone (Tomback et al. 1989, Arno and Hoff 1990) and as a minor seral in lower subalpine sites (Pfister 1977, Cooper et al. 1991).

Existing condition

The Heritage Program Network has ranked this species as G3, Vulnerable. Vulnerable species are at moderate risk of extinction or collapse due to a restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors. In Idaho, the Natural Heritage Program has ranked the species as S3 or Vulnerable. Such species are at moderate risk of extirpation in the jurisdiction due to a restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

There are three primary factors contributing to the decline of whitebark pine, including insect outbreaks, fire management, and introduced disease. There have been several major mountain pine beetle (*Dendroctonus ponderosae*) outbreaks that have killed many cone-bearing whitebark pine trees over 20 centimeters in diameter at breast height (Arno 1986, Waring and Six 2005). The effects of an extensive and successful fire-exclusion management policy since the 1930s have also reduced the area burned in whitebark pine forests, resulting in a decrease of suitable conditions for whitebark pine regeneration (Keane and Arno 1993, Kendall and Keane 2001). Whitebark pine benefits from fire because it is better adapted to surviving and regenerating after fire than associated shade-tolerant trees (Arno and Hoff 1990). Whitebark pine is slow growing in both height and diameter and it rarely grows faster than most of its competitors except on the most severe sites (Arno and Hoff 1990). It is often eventually replaced, in the absence of fire, mainly by the shade-tolerant subalpine fir but also by Engelmann spruce and mountain hemlock. Lodgepole pine can out-compete whitebark pine during early successional stages in some subalpine forests (Day 1967, Mattson and Reinhart 1990, Arno et al. 1993). Decades of fire suppression have limited the benefits of fire and favored other species. Finally, the introduction of the exotic fungus white pine blister rust (*Cronarium ribicola*) to the western United States circa 1910 has killed many five-needle pine trees, and whitebark pine is one of the most susceptible to the disease (Hoff et al. 1980, Keane and Arno 1993, Kendall and Keane 2001).

The cumulative effects of these three agents have resulted in a rapid decrease in mature whitebark pine over recent decades, especially in the more mesic parts of its range (Keane and Arno 1993). Predicted changes in the northern Rocky Mountains due to climate change could further exacerbate whitebark pine decline by increasing the frequency and duration of beetle epidemics, blister rust infections, and severe wildfires (Logan and Powell 2001, Blaustein and Dobson 2006, Running 2006). However, changes in fire regimes may favor regeneration of whitebark pine due to its fire adaptations. In addition, such changes may reduce competition with other species. It is unknown how whitebark pine as a species will persist under a future climate. While there is a general lack of understanding regarding the genetic variability or plasticity within whitebark pine, it is generally thought that whitebark pine may decline due to climate change primarily because of the current threats and severely reduced populations, its confinement to upper subalpine environments, and its reduced ability to naturally regenerate due to lower mast availability and subsequent reductions in Clark's nutcracker seed caches in areas of low whitebark pine populations (Halofsky et al. 2018b;c).

Due to the species obtaining status relatively recently and the extensive area of inaccessible occupied habitat, whitebark pine has rarely been the subject of focused surveys to confirm local range on the Nez Perce-Clearwater National Forests. However, knowledge of distribution has been gained through incidental means, informal observations, timber records and in some cases project level surveys where it has been noted after the species obtained candidate and sensitive status. Additionally, we have a documented research site on Beaver Ridge. However, because the species is associated with tree line where few projects occur, there has been little formal verification. While the current status in the project area is not quantified or fully known, observations reflect the same widespread decline as generally seen throughout most of the species' range. See the Status and distribution section above for discussion of the species range.

Current trends in whitebark pine condition and populations are of great concern. A severe and steep downward trend has been occurring in the whitebark pine population and health over the past few decades, especially in the northern Rocky Mountains (Keane 2012). This decline is expected to continue into the foreseeable future, although the rate may lessen simply because there are fewer live trees left to be impacted by disease or other threats. Mortality data collected in multiple studies throughout the range of whitebark pine strongly illustrates this substantial and pervasive decline throughout almost the entire range of the species (U.S. Department of the Interior 2011a).

In Canada, based on current mortality rates, it is anticipated that whitebark pine will decline by 57 percent by year 2100 (Committee on the Status of Endangered Wildlife in Canada 2010). The value for this anticipated decline is likely an underestimate, as it assumes current mortality rates remain constant into the foreseeable future while past trends have shown that mortality rates have been increasing over the last several decades. The range of mortality rates for whitebark pine in the United States are like those in Canada, which suggests that the anticipated rates of decline will be similar on the Nez Perce-Clearwater National Forests.

The Pacific Decadal Oscillation effects are determined by northern Pacific surface water temperatures and influence climatic trends across the northern Rockies and Great Plains. Over the last century, in Montana and northern Idaho, it is evident that the Pacific Decadal Oscillation influencing the western regional climate including the U.S. Forest Service Northern Region area has also influenced disturbances such as fire and mountain pine beetle and contributed to the ongoing whitebark pine decline. Given that the probability of continuing disturbance is high as climate projections predict a warming trend, the mortality of seed-producing whitebark pine may also be high.

There is substantial concern over the ability of whitebark pine to sustain itself throughout its range through natural regeneration. Some natural selection for resistance to blister rust is likely occurring (Hoff et al. 2001) but recovery will be slow as the species is slow growing and needs 60 to 80 years to produce sizable cone crops. The regeneration of the species is further hindered by evidence suggesting that stands with low basal area of live whitebark pine will not reliably attract Clark's nutcrackers necessary to support sufficient seed dispersal to provide for the maintenance of the species (McKinney et al. 2009). Reduced populations also face risks of inbreeding depression that may result in slow growth and less hardy trees that often exhibit lethal genes (Wright 1976). Given the overall widespread decline of whitebark pine observed on the Nez Perce-Clearwater National Forests, it is safe to assume these threats or any combination of them are present or have the potential to occur in the future.

The extensive studies of whitebark decline, along with decades of experience and observation, substantiates the past and ongoing severe decline of the species throughout its range, including the planning area and the expectation that this decline will continue for some time into the future. There is an urgent need to focus on conservation and restoration efforts for this keystone species across the extent of its range (Keane et al. 2012).

Projects are being implemented across the forests of U.S. Forest Service Northern Region and plan components in revised plans seek to slow or reverse the declining trend of this species. To aid in this effort the Wyoming office of the U.S. Fish and Wildlife Service has suggested management recommendations for federal, state, and local agencies or private entities to implement to benefit the species. A full listing of these recommendations is provided in the project file; they involve identifying and protecting trees with genetic resistance to blister rust; avoidance of physical damage to stands with healthy populations; remove only damaged, dead or dying trees prior to restoration activities; reduce whitebark pine competitors through thinning, prescribed fire or wildfire; implement restoration efforts focused on trees exhibiting genetic resistance to blister rust; maximize genetic diversity when developing seeds and seedlings for reintroduction in suitable habitat or orchard establishment; protect populations occupying margins of the species' range or unique ecological settings; and work with experts to develop and implement inventory and monitoring strategy for whitebark pine and Clark's nutcracker.

Effects of the proposed action

The factors pushing the species to federal listing are primarily the existing disease, insects and changed fire regimes rather than forest vegetation management. However, on the project level other management activities or ongoing uses may have effects on populations or individual whitebark pine trees. Due to the often-remote locations, these habitats generally have relatively few human use threats or stressors. Though there is potential for recreational off trail ATV damage in some areas, this potential impact would be uncommon and very small. Timber management and prescribed fire generally does not occur in subalpine elevations that support open subalpine habitats, but uncommon lower elevation occurrences of the tree may descend into the upper elevations of general forest and may be affected. Such activities generally do not affect existing whitebark pine trees directly, but generally are intended to provide earlier seral conditions or restore a more natural fire regime, both of which would benefit the species long term through addressing the primary threat factors. Due to the species' status, projects focused on maintaining or improving the species habitat will increase in the future. Changes in fire patterns and severity and associated effects on vegetation may be a stressor in some environments. Such changes may be related to climate change or fire exclusion or suppression. Westerling et al., (2006) stated that climate appears to be the primary driver of forest wildfire risk in the upper elevations.

Restoration of whitebark pine is not an emphasis of the existing 1987 forest plans. However, declines in whitebark pine populations over the last two decades has brought focus to this keystone species. The Nez Perce-Clearwater has invested in identifying plus-trees for genetic testing, cone collection and preservation as well as establishing the Beaver Ridge seed orchard. Whitebark pine seedlings have been planted within project areas were whitebark pine restoration is the primary objective.

There is a paradigm shift as to why and how vegetation is managed between the current 1987 Plans and the revised forest plan. Under the current plans forest vegetation within the suitable base is managed to maximize the sustained yield of timber. Under the revised plan vegetation within suitable lands is managed to promote restoration of ecosystems. Whitebark pine has never been a commercial species and is not harvested for timber. Incidental removal of whitebark pine may have occurred prior to ESA listing as a result of road construction under the current plans. Such an occurrence would have been extremely rare due to the intersection of existing whitebark pine populations and the suitable timber base. As a result of the 2008 Idaho Roadless Rule (36 CFR Part 294), significant portions of the suitable timber base were removed from potential timber harvest. Much of the roadless area occurs in the upper elevational bands of forested vegetation were whitebark pine may occur. The revised plan identifies roadless areas as management area 2. Timber harvest may occur within management area 2 but is only allowed if timber harvest is done to promote other resource benefits. For example, to promote restoration of whitebark pine, competing species such as subalpine fir and/or Engelmann spruce may be thinned to reduce ladder fuels within whitebark pine stands. The highest elevational bands of forested vegetation on the Nez Perce-Clearwater occur within designated wilderness areas where no timber harvest is allowed. The wilderness areas contain the majority of mapped whitebark pine acres. Less than one percent of the mapped whitebark pine acres occurs within management area 3 under the revised plan. All acres identified as suitable for timber production are allocated within management area 3. Management area 3 represents 31-percent of the Nez Perce-Clearwater. The remaining portions of the Forests are roadless or wilderness areas.

Under the revised plan whitebark pine restoration is expected to continue through interim guidance documented in the Recovery/Restoration (RRP) Project BA which includes R1 Idaho Whitebark Pine 7(d) Determination based on 4(d) Rule exceptions which is further refined by the R1 Idaho Whitebark Pine 7(d) Determination Short-term Project Modifications Options. Final guidance for the restoration of whitebark pine will be defined in the R1 Restoration and Recovery Programmatic BA which will guide development of restoration proposals.

The revised forest plan contains plan components that are intended to promote both preservation and restoration of whitebark pine habitats. Guidance provided in the 2012 Planning Rule require development of plan components intended to maintain and promote ecosystem sustainability. Ecosystem sustainability includes maintaining or restoring ecological integrity. The revised plan includes plan components, including standards or guidelines, and desired conditions to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity. Whitebark pine is included among the suite of species for which forest vegetation plan components are defined. Restoration of whitebark pine may be accomplished through addressing species composition desired conditions (FW-DC-FOR-09 13), structure desired conditions ((FW-DC-FOR-11, 12, MA1 and MA2-DC-FOR-03, 04, 08, and 09), and (MA3-DC-FOR-05, 07, and 08), and function desired conditions (FW-DC-FOR-10, MA1 and MA2-DC-FOR-05, and 08) and (MA3-DC-FOR-09). Additionally, restoration of whitebark pine is promoted through plan components that are intended to maintain and improve whitebark pine mature and old growth stands (MA2 and MA3-DC-FOR-10, MA2 and MA3-GDL-FOR-02, 02, and 04).

In some areas winter recreation also provides a threat to existing trees as portions of the trees that protrude above the snow may be damaged by motorized vehicles. There are no known studies that have documented or evaluated the impact of winter recreation on whitebark pine, but models indicating snow vehicle use and knowledge of where this use occurs on the Forest are useful to discuss the potential impacts.

Winter motorized over snow vehicle use is popular and increasing on the Nez Perce-Clearwater. Currently, motorized over-snow vehicle use is suitable on approximately 39 percent of the Forest. Actual use of this 39 percent is substantially less as snow levels and condition, terrain, vegetation, and distance from access points all influence where motorized over-snow vehicles can physically go, and where riders want to go. The revised land management plan identifies 60 percent of the Forest as suitable for this use. However, the same forces that currently limit where these users can and will go apply to this area.

In the revised forest plan, models identified areas as potentially suitable through Winter Recreation Opportunity Spectrum Settings and Suitability plan components. Under the preferred alternative of the Revised Forest Plan, areas suitable for winter motorized recreation increases from 39 percent up to 60 percent, while areas not suitable for winter motorized uses decreases from about 61 percent down to about 40 percent. However, where winter uses are authorized, winter recreation would not be distributed evenly on the landscape. Actual use by winter recreationalist or winter motorized users would be less than where it is considered suitable due to forested vegetation, access from passable roads and limitations of slope, and terrain. Also, it is likely that areas predicted to be higher probability winter recreation use areas could be constrained by topographic barriers that preclude use, even when predicted to have high relative probabilities of use.

While more of the forest will be suitable for winter use under the proposed action, the plan would not open areas to winter motorized vehicles. Any new winter motorized recreation will only be authorized after a site-specific travel plan NEPA analysis and Endangered Species Act consultation.

Analysis, as documented in the FEIS Chapter 3.2.9 – Wildlife, and the Biological Assessment indicates that much of this suitable area is not desirable to over snow vehicle users and even less is identified by these user groups as popular use areas. However, it is possible that popular use areas may be established or disappear as vegetation conditions change in response to disturbance and succession. This will further influence where over snow vehicle users may go, while considering the above-mentioned limiting factors. It is difficult to determine where these changes may occur or the potential benefits or detriments to white bark pine that may take place as a result of these changes. The areas used by snowmobiles were then compared to the modeled potential and existing whitebark pine habitat on the Forest. Of the potential whitebark pine habitat across the Forest, approximately 19 percent occurs in the general areas typically used by motorized winter recreationists. Of the existing, forestwide, occupied whitebark pine habitat, approximately 25 percent is found in areas identified as supporting most winter recreation. Of the areas identified as most used by motorized winter recreationist, approximately 29 percent is modeled potential whitebark pine habitat, while only one percent of the same area is expected to support existing whitebark pine stands. However, areas of actual motorized use in these areas would be notably smaller than the total area identified due to the mentioned terrain, access and vegetative factors that dramatically limit the ground such vehicles can reach. Particularly, most whitebark pine occurrence would be on the higher, steeper ridgelines that generally would not be accessible. In addition, snow would protect seedlings, and taller saplings that may rise above the snow surface are avoided by operators who would not wish to potentially damage their vehicles. So while damage to such trees may occur, it would be a very unlikely event.

Considering the known factors and potential unknown conditions, the areas currently used by over snow vehicles were compared to the modeled potential and existing whitebark pine habitat on the Forest. Of the areas identified as most used by motorized winter recreationist, approximately 29 percent is modeled potential whitebark pine habitat; with approximately 1 percent of this area supporting existing whitebark pine populations. Therefore, given that a majority of the potential and existing whitebark pine habitat is within designated or recommended wilderness areas where motorized over snow vehicle use is prohibited under the land management plan and given the limited area of overlap as described above, the impacts of motorized over snow vehicle use on the persistence of whtiebark pine is expected to be minimal.

Plan Components

Several plan components may indirectly support ecological conditions to maintain suitable habitats to contribute to the persistence of plant species of conservation concern including whitebark pine. Others that more directly involve whitebark pine and appropriate subalpine habitats are presented here.

Timber and forest vegetation plan components express a desired condition to maintain whitebark pine in appropriate habitats on the forest. These include, FW-DC-FOR-09, where whitebark pine is common on the colder habitat types, either as pure stands or in mixtures; FW-DC-FOR-10, where whitebark pine of all sizes is present on the colder habitat types; MA1-DC-FOR-09 and MA2-DC-FOR-09, where whitebark pine of all sizes is present on the colder habitat types; MA2-DC-FOR-10, where whitebark pine dominant old growth cover types are maintained or increased from existing amounts; MA3-DC-FOR-07 calls for whitebark pine of all sizes to be present on the colder habitat types; MA3-DC-FOR-08, seeks a density that promotes vigorous stands of the whitebark pine and provides for wildlife habitat and resistance to stand replacing fire; and MA3-DC-FOR-10, where whitebark pine dominant old growth cover types are maintained or increased from existing amounts.

Also included are several desired conditions that call for appropriate stand composition of cold forest types. Specific objectives directing the restoration of cold forest types that support successional stages that could benefit whitebark pine include MA2-OBJ-FOR-05 and MA3-OBJ-FOR-04. These objectives increase seral species components within Cool Moist and Cold PVTs through artificial regeneration following wildfire. MA2-GDL-FOR-02 and MA3-GDL-FOR-02 authorizes vegetation management that would be designed to maintain or increase resistance and resiliency of whitebark pine to disturbance or stressors in older stands. Though it is unlikely that stands of whitebark pine occur in MA3, MA3-GDL-FOR-03 states that road construction should not pass through such stands if they occur. While none of these components directly address stressors such as disease and insects that have reduced whitebark pine, they authorize and encourage management activities that will lead to more natural conditions that will promote and favor the species through increased resiliency and recruitment.

Desired condition FW-DC-GS-05 supports grasslands, and subalpine parkland habitats that provide for at-risk species including open whitebark pine.

Fire and fuels management component FW-DC-FIRE-01, seeks to restore and maintain landscapes that are resilient to fire-related disturbances. Natural fuel conditions emulate the structure, species mix, spatial pattern, extent, and resiliency of the historic fire regime of the area. Wildland fires burn with a range of intensity, severity, and frequency that allows ecosystems to function in a healthy and sustainable manner. This condition would contribute to whitebark pine retention. FW-DC-FIRE-02 calls for a full range of fire management activities, including both prescribed fire and natural wildfire to achieving ecosystem sustainability, including improved ecosystem resilience, which would improve conditions for whitebark pine. FW-OBJ-FIRE-01 calls for fire to improve or maintain desired forest vegetation conditions based on the historical disturbance regimes and FW-OBJ-FIRE-02 addresses hazardous fuels mitigation to desired conditions are achieved. FW-OBJ-FIRE-03 seeks to allow fire to play its natural role to reduce the risk of uncharacteristic and undesirable wildland fires by managing natural and unplanned ignitions to meet desired conditions. This would aid in the restoration of natural fire regimes in whitebark pine and help maintain the species into the future. FW-GDL-FIRE-01 seeks to integrate wildland fires with forest health projects and past fires to improve habitats on the landscape. Also, there is the goal of building understanding and support of fire's role in sustaining fire adapted ecosystems, as stated in FW-GL-FIRE-04. Implementation and achievement of fire components will promote more natural conditions that will promote and favor whitebark pine through increased resiliency and recruitment.

Wildlife plan components FW-GL-WL-01, FW-DC-WL-01, and FW-DC-WL-02 encourage cooperation and collaboration across multiple agencies to work on a variety of planning and management tasks to work toward recovery of federally listed species. Plan component FW-STD-WL-01 directs lynx habitat to be managed in accordance with Northern Rockies Lynx Management Direction, which provides exceptions for whitebark pine conservation. The exceptions include 1,885 acres of precommercial thinning in lynx habitat over the next 15 years. Thinning will provide more open, early seral conditions that whitebark pine prefer. Competition with other species would be reduced.

Land allocation components such as MA2-DC-IRA-02 call for the composition, structure, and pattern of vegetation reflect natural disturbances. This will promote the maintenance of whitebark pine, especially concerning past altered fire regimes. MA2-DC-RNA-01 designates Research Natural Areas that represent vegetation types and processes for research and monitoring. Natural processes in RNAs would promote maintenance of whitebark pine, especially since many of these designated areas support populations of this species. Treatment of forest vegetation in the Gospel Hump Geographic Area through components GA-OBJ-GH-01-04 will promote whitebark pine at suitable sites.

Generally, livestock use does not occur at higher elevations where whitebark pine may occur; however, there are some exceptions where livestock use does extend into the subalpine. FW-GDL-GRZ-01 seeks to reduce impacts resulting from livestock use to benefit riparian areas, meadows, and other habitats that may be important to species of conservation concern. FW-GDL-GRZ-02 states that allotment planning should include measures to protect federally listed plant species and evaluate habitats for other at-risk species and adjust prescriptions as necessary to ensure population viability. FW-GDL-GRZ-03 directs that utilization occurs at levels that will maintain vegetative vigor and community health and planning considers the condition, timing, and use of the resource along with other values of the area. While this mainly applies to lower elevation grassland habitats, following these guidelines wherever grazing occurs will help maintain vigor and ecosystem health for numerous species of concern potentially affected by this resource use.

Recreation components that could involve whitebark pine include FW-DC-REC-01 that seeks to establish winter recreation opportunities among other things, and FW-DC-REC-13 that may remove trails not needed to avoid a proliferation of unnecessary routes. These components may be important to address physical damage to trees in areas of winter motorized use.

Cumulative Effects

The effects area includes lands within the proclaimed boundaries of the Nez Perce-Clearwater National Forests. Actions on adjacent nonfederal lands have a possibility to affect whitebark pine populations on National Forest System lands, but likely only for those populations nearest the forest boundaries. It is not possible to state what actions are likely to occur on adjacent private lands, but it is assumed these lands would be managed as they are today. Nonfederal actions most likely to affect whitebark pine on adjacent National Forest System lands involves vegetation management on adjacent private lands. However, as with federal lands such projects in upper elevation forests and subalpine habitats would be uncommon. Projects specifically for improvement to whitebark pine habitat would be less likely to occur on private lands. The effects of other management activities on adjacent private, state, and federal lands are expected to be confined to those lands and not overlap in time and space with whitebark pine on National Forest System lands.

Increasing Human Populations

Additional stressors that may increase in the future are increasing human population levels, both locally and nationally, with resulting increasing demands and pressures on public lands. As related to forest and vegetation conditions, these changes may lead to increased demands for commercial and non-commercial forest products, elevated importance of public lands in providing for habitat needs of species, and changing societal desires related to the mix of uses public lands should provide. The plan components are adequate to support persistence of at-risk plant populations and habitat on the Nez Perce-Clearwater as human populations and demands increase. However, population and use trends suggest not only that public land will play an increasingly important role in the conservation of these species in the future, but also that management of human use impacts to ensure recovery and prevention of federal listing of species will be an increasingly difficult challenge.

Adjacent Lands and Other Management Plans

Portions of the Nez Perce-Clearwater adjoin other National Forests, each having its own forest plan. The adjacent forests include the Idaho Panhandle, Lolo, Bitterroot, Salmon–Challis, Payette, and Wallowa–Whitman National Forests. Generally speaking, management of vegetation, including species of concern, is consistent across all national forests due to law, regulation, and policy. The cumulative effects would be that the management of at-risk plants and habitats would provide adequate protection to prevent species from decline or loss of persistence. The Nez Perce-Clearwater is also intermixed with lands of other ownerships that include private lands, other federal lands, and state lands.

Bureau of Land Management (BLM) lands primarily to the west of the Nez Perce-Clearwater are managed by the Cottonwood field office through the 2009 Cottonwood Resource Management Plan. The plan is complementary to the Nez Perce-Clearwater Forest Plan in terms of managing for multiple uses and sustaining healthy and functional ecosystems. Broadly speaking the plan would likely contribute toward similar general desired conditions as the Nez Perce–Clearwater Forest Plan, with much of the management guidance having similar intent with respect to resource protections. BLM lands to the west of the Forest do not obtain suitable elevations for whitebark pine; however, some lands to the north and south of the Forest do.

The Idaho Natural Heritage Program is a member of NatureServe, an international network of biological inventories known as natural heritage programs or conservation data centers that operate in all 50 U.S. states, Canada, Latin America, and the Caribbean. This system provides important tools that allows locations and related information on rare species to be entered and shared for environmental review and conservation purposes. Lists of rare, unique, or vulnerable plants, animals, and biological communities are maintained by each heritage program. At this time the Forest has utilized little information from the

Idaho Natural Heritage program, but as populations are documented and tracked through time, we anticipate that information will be useful in the management of the species.

The State of Idaho manages timberlands to maintain income for endowment trusts in accordance with the Idaho Forest Practices Act. The Idaho Department of Lands administers the Idaho Forest Practices Act (1974) to promote active forest management and ensure that the health of forest soil, water, vegetation, wildlife, and aquatic habitats. While the State Natural Heritage Program maintains a database of species of concern, only species federally listed by the U.S. Fish and Wildlife Service have official status or management protections on state lands. While maintaining economically sustainable products, the Idaho Forest Action Plan seeks to promote forests that are diverse and resilient to changes in climate and human activities and maintain ecosystem benefits. Whitebark pine occurrences and habitat may extend across jurisdictional boundaries, thus improvements to habitat regardless of management responsibility may benefit the species across its local range. It is anticipated that because federally listed species have status on State lands, management of State resources will take appropriate conservation measures to protect or enhance whitebark pine and maintain ecosystem benefit the action plan seeks to promote.

No at-risk plant protection is provided as part of any area county resource plans. These plans generally acknowledge the importance of special habitats in supporting species diversity ecosystem function, which provides a course filter benefit for all at-risk species in such habitats. At-risk plants on private lands are at greater risk of local extirpation due to lack of protections. Such county plans generally are focused on the effective control and reduction of noxious weeds. Successful efforts in weed control would contribute to the maintenance or improvement of habitats important to ecosystem function and at-risk species where they occur; however, higher elevations such as those supporting whitebark pine do not support substantial weed occurrences.

Climate Change

Climate change is expected to profoundly alter vegetation structure and composition, terrestrial ecosystem processes, and the delivery of important ecosystem services over the next century (Kerns et al. 2017). Climate influences the spatial distribution of major vegetation biomes, the abundance of species and communities within biomes, biotic interactions, and the geographic ranges of individual species. Researchers speculate that a warming climate will alter precipitation patterns, with some regions becoming drier and others becoming wetter. Within the Pacific Northwest, a recent model predicts warmer and wetter winters in 80 years. Being stationary, plants must migrate through dispersal, colonization, and recruitment strategies, a relatively slow process compared to mobile organisms. Some researchers believe that plant species will not be able to migrate at a pace dictated by a warming climate, which would isolate and eventually doom some species, unless new adaptations arise to cope with a changing environment. Under the influence of changing climate, if droughts and warmer winters continue, agents such as insects and disease will likely show increased levels of activity. Mortality from these factors and drought would likely lead to fires that burn with greater intensity when weather favorable to high intensity fires develops. Such events may further reduce potential habitats and limit ability to species to respond and migrate. These factors may be particularly important to whitebark pine as they already affect disease and insects that have contributed to the species decline. In addition, subalpine species may be more dramatically impacted if warming trends push subalpine habitats to a higher elevation than exists on the landscape.

Primary strategies to address climate change threats focus on increasing resilience to ecological disturbance (wildfire, insects, and nonnative species) (Halofsky and Peterson 2016). Rare and disjunct species and communities require adaptation strategies and tactics focused on encouraging regeneration, preventing damage from disturbance, and establishing refugia. Overall, the protection and restoration objectives and practices described in the revised forest plan, will potentially promote resilience and conservation.

Determination of effects

Implementation of the Forest plan would contribute to the maintenance and restoration of whitebark pine on the Nez Perce-Clearwater National Forests and result in a may affect – likely to adversely affect determination.

Conclusion – Determination of Effects

Summary of Effects Determinations by Species

Table 140. Summary of Effects Determinations by Species

Species	Status	Determination
Spaldings catchfly (*Silene spaldingii*)	Threatened	Likely to adversely affect
Whitebark pine (*Pinus albicaulis*)	Threatened	Likely to adversely affect

Appendix A: Potential Management Approaches

This appendix describes some of the possible actions and potential management approaches and strategies the Nez Perce-Clearwater National Forests might undertake to maintain or make progress towards achieving the desired conditions described in the Land Management Plan. It is also intended to help clarify how the planned outcomes (i.e., objectives, desired conditions) in the plan might be achieved. The potential management approaches included here may be used to inform future proposed and possible actions. It does not serve as a "to do list" of projects; it does not suggest expected locations or dates of implementation; and it is not an all-inclusive list.

This appendix provides information by individual resource areas that is intended to clarify the intent and provide suggested means to achieve specific Land Management Plan direction and components related to each resource area. Potential management approaches and strategies presented in this section may include suggestions for on-the-ground implementation, analysis, assessment, inventory, or monitoring, as well as partnership and coordination opportunities the Nez Perce-Clearwater is suggesting might be helpful in achieving its desired conditions. The potential approaches and strategies are not intended to be all-inclusive, nor are they commitments to perform specific actions. The types of actions that are exemplified in this appendix do not commit the Nez Perce-Clearwater to perform or permit these actions but are provided as actions that would likely be consistent with plan components and that might be undertaken to maintain or move towards the desired conditions and objectives. Although the purpose and need developed for a specific project may address one or more desired conditions identified in the Land Management Plan, each individual desired condition would not need to be met on every project nor in every treatment area within a project.

The Nez Perce-Clearwater Land Management Plan employs a strategy of adaptive management in its decision making and achievement of the plan's desired conditions and objectives. An adaptive management strategy emphasizes the learning process. It involves using the best current knowledge to design and implement management actions, then monitoring and evaluating results and adjusting future actions based on what has been learned. This is a reasonable and proactive approach to decision making considering the degree of uncertainty in future ecological, social, and economic factors. This appendix describing potential management approaches and possible actions is optional content in the Nez Perce-Clearwater plan. Land Management Plans may include optional content such as potential management approaches, strategies and partnership opportunities, or coordination activities (36 CFR § 219.7(f)(2)).

Aquatic Potential Management Approaches and Multiscale Analysis

Potential Management Approaches: Multiscale Analysis

Plan Component(s)

- FW-STD-WTR-04
- FW-STD-RMZ-01
- FW-STD-RMZ-06
- FW-STD-CWN-01

Purpose of Plan Component(s)

The standards are designed to constrain project activities so that they do not retard attainment of aquatic and riparian desired conditions.

Multiscale Analysis can be utilized by specialists to help determine consistency with standards FW-STD-WTR-04, FW-STD-RMZ-01, FW-STD-RMZ-06, and FW-STD-CWN-01. The use of Multiscale Analysis could provide the context and identify needs for project activities to restore aquatic and riparian habitat, as well as the context and the role those activities play in the recovery of federally listed aquatic species. Multiscale Analysis could result in recommendations for conservation measures for aquatic species by considering data from different spatial scales and informing project effects analyses. This could help determine whether a project should include aquatic restoration activities to maintain or move toward Forest Plan desired conditions as identified in table 141 in the Multiscale Analysis section, below.

The Stream Conditions Indicator Assessment (SCIA) is a key step in the Multiscale analysis. The SCIA can be used during project development to evaluate the existing condition of stream and riparian indicators and their status versus a range of desired conditions. SCIA is methodology intended to provide consistent documentation and approach for evaluating conditions and departures and how project actions may influence aquatic and riparian desired conditions. During project development, use of the SCIA can provide an indication of whether aquatic and riparian habitats are functioning or not, as well as describe the existing hydrologic and sediment regimes and floodplain function. The methodology allows current conditions to be assigned to one of the three categories of Functioning at High Level, Function at Moderate Level, or Functioning at Low Level.

This methodology may be particularly useful for helping target proposed aquatic restoration actions designed to restore or maintain aquatic and riparian desired conditions, especially where indicators are determined to be functioning at moderate or low levels.

Possible Management Strategy and Approach

Multiscale Analysis

The six-step framework for Multiscale Analysis consists of the following steps:

Identify and map locations of listed native fish and species of conservation concern fish populations, and critical habitat to determine areas of greatest concern within the project area.

Coarse Filter - Identify Limiting Factors within Project Area

Medium Filter – Stream Condition Indicator Assessment (SCIA)

Fine Filter – Field Verification of Conditions & Multiscale Analysis Questions

Identify Conservation/Restoration Actions

Effectiveness Monitoring

Table 141 describes the connection between desired conditions, stream condition function, and the associated limiting factors from the Snake River Spring/Summer Chinook Salmon & Snake River Basin Steelhead Snake River Recovery Plans and primary threats, identified in the Recovery Unit Implementation Plan for bull trout. These connections will be used to identify the limiting factors in the coarse filter followed by the indicators to be evaluated in the medium filter.

Table 141. Desired conditions and stream condition indicator

Aquatic and Riparian Desired Conditions	Desired Condition Plan Component	Stream Condition Function	Recovery Plan Tributary Habitat Limiting Factors
FW-DC-WTR-01	National Forest System lands provide the distribution, diversity, and complexity of watershed and landscape-scale features including natural disturbance regimes and the aquatic and riparian ecosystems to which species, populations, and communities are uniquely adapted. Watersheds and associated aquatic ecosystems retain their inherent resilience to respond and adjust to disturbances, including climate change, without long-term, adverse changes to their physical or biological integrity.	Stream Complexity/ Channel Form	Stream Complexity/ Channel Structure
FW-DC-WTR-02	Spatial connectivity exists within or between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact habitat refugia. These network connections provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic, riparian-associated, and many upland species of plants and animals.	Connectivity	Passage Barriers
FW-DC-WTR-03	Aquatic habitats contribute to ecological conditions capable of supporting self-sustaining populations of native species and diverse plant, invertebrate, and vertebrate aquatic and riparian-dependent species. Aquatic habitats are key contributors to for the recovery of threatened and endangered fish species and provide important habitat components for all native aquatic species.	Floodplain Function, Riparian Condition	Floodplain Connectivity
FW-DC-WTR-04	Instream habitat conditions for managed watersheds move in concert with or towards those in reference conditions. Aquatic habitats are diverse, with channel characteristics and water quality reflective of the climate, geology, and natural vegetation of the area. Instream habitat conditions across the forest, such as large woody material, percent pools, residual pool depth, median particle size, and percent fines are within reference ranges as defined by agency monitoring (e.g., PIBO) and match the frequency distribution of comparable reference sites for a given channel type, channel size, climate, and geomorphic setting.	Stream Complexity/ Channel Form	Stream Complexity/ Channel Structure
FW-DC-WTR-05	Water quality, including groundwater, meets or exceeds applicable state water quality standards, fully supports designated beneficial uses, and is of sufficient quality to support surrounding communities, municipal water supplies, and natural resources. The Forest has no documented lands or areas that are delivering water, sediment, nutrients, and/or chemical pollutants that would result in conditions that violate the State of Idaho's water quality standards or are permanently above natural or background levels.	Temperature, Sediment Regime	Water Quality/ Temperature, Excess Sediment
FW-DC-WTR-06	Sediment delivery to streams is of the types, quantities, and rates that support the natural instream sediment transport and storage rates and instream sediment substrate composition. The sediment regime in water bodies is not chronically affected by management activities to the extent that the availability of functioning spawning areas and interstitial spaces are reduced.	Hydrologic Regime, Sediment Regime	Excess Sediment

Aquatic and Riparian Desired Conditions	Desired Condition Plan Component	Stream Condition Function	Recovery Plan Tributary Habitat Limiting Factors
FW-DC-WTR-07	Instream flows are sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows are retained. Stream flow regimes maintain riparian ecosystems and natural channel and floodplain dimensions. Stream channels transport sediment and woody material over time while maintaining reference dimensions (e.g., bankfull width, depth, entrenchment ratio, slope, and sinuosity).	Channel Form	Floodplain Connectivity, Stream Complexity
FW-DC-WTR-08	Groundwater dependent ecosystems, including peatlands, bogs, fens, wetlands, seeps, springs, riparian areas, groundwater-fed streams and lakes, and groundwater aquifers, persist in size and seasonal and annual timing and exhibit water table elevations within the natural range of variability. Surface and groundwater flows provide late-season stream flows, cold water temperatures, and sustain the function of surface and subsurface aquatic ecosystems.	Temperature	Water Quality/ Temperature
FW-DC-WTR-09	Beavers are present in watersheds where their activities benefit ground water, surface water, and aquatic habitat complexity, and where their activities support conservation and recovery of imperiled aquatic species.	Channel Form	Stream Complexity/ Channel Structure
FW-DC-WTR-10	Critical habitat components (physicaly and biological features) provide the ecological conditions necessary to achieve species recovery. Spawning, rearing, and migratory habitats are widely available and inhabited. Listed aquatic species have access to historic habitat and appropriate life history strategies (e.g., bull trout resident, fluvial, adfluvial, and anadromy) are supported.	Connectivity	Passage Barriers
FW-DC-WTR-11	Water cooling mechanisms in unconfined channels that are dependent on the exchange of surface water and groundwater are functioning at full potential. Cooling mechanisms include dynamic scouring and bar formation, activation of side channels during high flow events, and inundation of the full floodplain extent during floods with an approximate 5-10-year return interval.	Channel Form	Stream Complexity/Channel Structure
FW-DC-CWN-01	Conservation Watershed Networks have functionally intact ecosystems that provide high-quality water and contribute to and enhance the conservation of aquatic species of conservation concern and recovery of threatened or endangered fish species.	Temperature	Water Quality
FW-DC-CWN-02	Streams within the Conservation Watershed Network provide habitat that supports robust native fish populations, which are able to expand to and recolonize adjacent unoccupied habitats. These areas conserve key demographic processes likely to influence the sustainability of aquatic species.	Connectivity	Passage Barriers
FW-DC-CWN-03	Roads in the Conservation Watershed Network present minimal risk to aquatic resources.	Floodplain Function, Sediment Regime, Channel Form	Floodplain Connectivity, Excess Sediment

Aquatic and Riparian Desired Conditions	Desired Condition Plan Component	Stream Condition Function	Recovery Plan Tributary Habitat Limiting Factors
FW-DC-RMZ-01	Riparian Management Zones reflect a natural composition of native flora and fauna and a distribution of physical, chemical, and biological conditions as compared to reference conditions. The species composition and structural diversity of native plant communities in riparian management zones provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration. Nutrients, large woody debris, and fine particulate organic matter are supplied in amounts and distributions sufficient to sustain physical complexity and stability.	Temperature, Channel Form	Riparian Condition, Stream Complexity/ Channel Structure
FW-DC-RMZ-02	Riparian Management Zones feature key riparian processes and conditions that function consistent with local disturbance regimes, including slope stability and associated vegetative root strength, wood delivery to streams and within the riparian management zones, input of leaf and organic matter to aquatic and terrestrial systems, solar shading, microclimate, and water quality.	Riparian Condition, Temperature, Channel Form	Water Quality/ Temperature, Stream Complexity/ Channel Structure
FW-DC-ARINF-01	The transportation system has minimal impacts on aquatic and riparian conditions through reduced hydrologic connectivity of roads to streams, lower sediment delivery to streams, and improved aquatic organism passage, where transportation infrastructure affects these features.	Hydrologic Regime, Sediment Regime, Connectivity	Floodplain Connectivity, Excess Sediment, Passage Barriers
FW-DC-ARREC-01	Recreation facilities and their use, including trails and dispersed sites, have minimal impacts on aquatic resources, including threatened and endangered species, designated critical habitat, and species of conservation concern.	Riparian Condition, Channel Form	Riparian Condition, Excess Sediment, Stream Complexity/ Channel Structure
FW-DC-MWTR-01	Lands that contribute to municipal watersheds and source water protection areas are in a condition that contributes to consistent delivery of clean water and meets or exceeds State of Idaho water quality standards.	Hydrologic Regime, Sediment Regime	Water Quality, Excess Sediment

Step 1: Identify and Map

Identify and map locations of federally listed native fish and species of conservation concern fish populations, and critical habitat to determine areas of greatest concern within the project area.

Basin Scale (e.g., Clearwater Basin, Salmon Basin)

- Determine if watershed(s) contain major population group or population identified in the Snake River spring/summer Chinook salmon and Snake River Basin Steelhead Recovery Plan.
- Determine if watershed major population group status is rated as Maintain or High Risk and identify gap between its status and proposed status (Final Snake River Snake River Spring and Summer Chinook and Snake River Basin Steelhead Recovery Plan).
- Determine if watershed(s) contain local population identified in the Mid-Columbia Recovery Unit Implementation Plan or Upper Snake Recovery Unit Implementation Plan for Bull Trout.

- If relevant and accessible, include map of fish distributions of steelhead and spring/summer Chinook populations within each MPG (see Snake River recovery plan) or bull trout local populations.

Subbasin Scale (e.g., Upper North Fork Clearwater, Lochsa, South Fork Clearwater)

- Include location of project area on the map.
- Include map of designated critical habitat for steelhead, bull trout, and fall Chinook across subbasin.
- Identify critical habitat for the potential restoration area and briefly describe its importance to the species recovery (see Snake River recovery plans; Columbia River bull trout recovery plan).
- Include mapped major and minor spawning areas for steelhead and spring/summer Chinook salmon.
- Include mapped local populations of bull trout Recovery Unit, within project area.
- Include a fire history map across the subbasin.
- Include a timber harvest map across the subbasin.
- Include map of natural disturbances such as landslides and flood history
- Include active grazing allotments maps across the subbasin.
- Include active mining claims across the subbasin.
- Identify Idaho Department of Environmental Quality impaired waters and TMDLs for the subbasin.

Sources for downloadable GIS information:

- US Forest Service: FSGeodata Clearinghouse Website: https://data.fs.usda.gov/geodata/edw/datasets.php
- USDA GeoSpatialDataGateway Website: https://datagateway.nrcs.usda.gov/GDGOrder.aspx
- StreamNet: Fish data for the northwest Website: https://www.streamnet.org/data/interactive-maps-and-gis-data/
- Norwest Stream Temperature Map Website: https://usfs.maps.arcgis.com/apps/webappviewer/index.html?id=bf3ff38068964700a1f278eb9a940dce
- NOAA fisheries: Species maps and data Website: https://www.westcoast.fisheries.noaa.gov/maps_data/Species_Maps_Data.html
- Idaho Department of Fish and Game for fish distribution and temporal data. GIS layers are stored internally, and data is managed in different databases so inquire regional biologist for best point of contact
- Idaho Department of Environmental Quality 303(d)/305(b) Integrated Report Website: https://mapcase.deq.idaho.gov/wq2020/default.html

Step 2: Coarse Filter - Identify Limiting Factors within Project Area

Watershed (HUC10) and/or Subwatershed (HUC12) Scale

- Review tributary habitat limiting factors identified in Snake River Recovery Plans (Table 142, Table 143, Table 144, and Table 145) and primary threats, if applicable, identified in the Recovery Unit Implementation Plan for bull trout (Table 145).
- Review PIBO data for the Nez Perce-Clearwater National Forests to determine whether stream indicators (stream habitat attributes) in relevant managed watersheds are within reference ranges. Those that are not considered limiting factors.
    - PIBO indicators include:
        - Residual Pool Depth
        - Pool Percent
        - Median Substrate
        - Pool Fines
        - Wood Frequency
        - Bank Angle
- Identify which coarse filter factors are considered limiting for the watershed/subwatershed where the project is located. Carry forward the identified limiting factors to step 3.

Table 142. Tributary habitat limiting factors for Snake River steelhead populations within the Nez Perce-Clearwater National Forests, Clearwater River Major Population Group

Population	Stream Complexity	Excess Sediment	Passage Barriers	Altered/ Low Flow	Water Quality/ Temperature	Riparian Condition	Floodplain Connectivity
L Main Clearwater R.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selway River	No	Yes	Yes	No	Yes	Yes	No
Lolo Creek	Yes	Yes	Yes	No	Yes	Yes	No
Lochsa River	Yes	Yes	Yes	No	Yes	Yes	No
SF Clearwater River	Yes	Yes	Yes	No	Yes	Yes	Yes

Table 143. Tributary habitat limiting factors for Snake River steelhead populations within the Nez Perce-Clearwater National Forests, Salmon River Major Population Group

Population	Stream Complexity	Excess Sediment	Passage Barriers	Altered/ Low Flow	Water Quality/ Temperature	Riparian Condition	Floodplain Connectivity
Little Salmon River	Yes	Yes	Yes	Yes	Yes	Yes	No
Chamberlain Creek	Yes	Yes	Yes	No	Yes	Yes	No

Table 144. Tributary habitat limiting factors for Snake River spring/summer Chinook salmon populations within the Nez Perce-Clearwater National Forests, South Fork Salmon River Major Population Group

Population	Stream Complexity	Excess Sediment	Passage Barriers	Altered/ Low Flow	Water Quality/ Temperature	Riparian Condition	Floodplain Connectivity
Little Salmon River	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 145. Tributary habitat limiting factors for Mid-Columbia River Recovery Unit bull trout populations within the Nez Perce-Clearwater National Forests

Population	Stream Complexity	Excess Sediment	Passage Barriers	Altered/ Low Flow	Water Quality/ Temperature	Riparian Condition	Floodplain Connectivity
Clearwater River Portion of the Lower Snake Geographic Area (includes South Fork Clearwater River, Lochsa River, Selway River and North Fork Clearwater River Core Areas	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Step 3: Medium Filter – Stream Condition Indicator Assessment (SCIA)

Subwatershed (HUC12) Scale or Project Level Scale

For limiting factors identified in Step 2, locate which indicators are associated with those limiting factors in table 146. Carry forward the indicators for further analysis under the medium filter – stream condition indicator assessment.

Table 146. Multiscale Analysis Filters

Stream Condition Function	Indicator	Coarse Filter	Medium Filter	Fine Filter
Hydrologic Regime	Water Yield/Peak Flow	Recovery Plan Tributary Limiting Factor: Altered Flow	GIS data associated with Nez Perce-Clearwater Approach to Assess Water Yield and Peak Flow	Field Verify Conditions
Sediment Regime	Unstable Slopes/ Intersecting Roads	Recovery Plan Tributary Limiting Factor: Excess Sediment	GIS Layers for unstable slopes and mass movement areas	Field Verify areas identified
Sediment Regime	Sediment Impaired - 303d	Recovery Plan Tributary Limiting Factor: Excess Sediment	Idaho DEQ GIS 303d stream layer	Total Maximum Daily Load or Beneficial Use Reconnaissance Project data
Sediment Regime	% Pool Fines	PIBO: Residual Pool Depth, Pool Percent, Median Substrate, Pool Fines and/or Recovery Plan Tributary Limiting Factor: Excess Sediment	GIS Layers of PIBO Data used at Sub-basin Scale	Field Verify Pool Fine Conditions
Sediment Regime	Road/stream crossings	Recovery Plan Tributary Limiting Factor: Excess Sediment	GIS Layers of stream crossing inventory	Field Verify Conditions
Sediment Regime	Motorized Trail Crossings	Recovery Plan Tributary Limiting Factor: Excess Sediment	Trails Route Layer	Field Verify Trail Stream Crossing Conditions
Sediment Regime	Miles of roads with High modeled sediment delivery risk	Recovery Plan Tributary Limiting Factor: Excess Sediment	GIS Layers of road network, WEPP/GRAIP Lite modeling	Field Verify Road Segments of Concern
Floodplain Function	Streamside Roads	Recovery Plan Tributary Limiting Factor: Floodplain Connectivity	GIS Layers of streamside roads	Field Verify Conditions
Floodplain Function	Altered stream channel or floodplain (e.g., dredge mined; grazing impacts)	Recovery Plan Tributary Limiting Factor: Floodplain Connectivity	GIS/Aerial Imagery of anthropogenic floodplain disturbance (grazing, mining, roads)	Field Verify Conditions
Stream Complexity/Channel Form	Altered stream channel or floodplain (e.g., dredge mined; grazing impacts)	PIBO Bank Angle and/or Recovery Plan Tributary Limiting Factor: Stream Complexity	GIS/Aerial Imagery of anthropogenic floodplain disturbance (grazing, mining, roads)	Field Verify Conditions

Stream Condition Function	Indicator	Coarse Filter	Medium Filter	Fine Filter
		and Channel Structure		
Stream Complexity/Channel Form	Large Woody Debris	PIBO Wood Frequency and/or Recovery Plan Tributary Limiting Factor: Riparian Condition or Stream Complexity or Floodplain Connectivity	GIS Layers of PIBO Data used at Sub-basin Scale	Ground truth unconfined channels, riparian stands, disturbance regimes
Temperature	NorWeST Stream Temperature	Recovery Plan Tributary Limiting Factor: Water Quality Temperature	NorWest temperature mode for mean August temperature	Field Data (temp loggers)
Temperature	Temperature Impaired - 303(d)/305(b)	Recovery Plan Tributary Limiting Factor: Water Quality Temperature	Idaho DEQ GIS 303(d)/305(b) stream layer	Total Maximum Daily Load or Beneficial Use Reconnaissance Project data
Temperature	Cooling Processes	Recovery Plan Tributary Limiting Factor: Water Quality Temperature	Netmap/LiDar - estimate of stream shading	Photopoints, field verify stream shade canopy cover, large woody debris
Connectivity	Aquatic Organism Passage	Recovery Plan Tributary Limiting Factor: Passage Barrier	GIS identified passage barriers	Field Verify Passage Barriers Identified
Riparian Condition	Riparian plant composition, structure, diversity	Recovery Plan Tributary Limiting Factor: Riparian Condition	GIS/Aerial Imagery of anthropogenic floodplain disturbance (grazing, mining, roads) and Beaver Restoration Action Tool - streams <15%	Field Verify Conditions

When completing a full multiscale analysis, only identify departure from desired condition for indicators that are identified as limiting factors in the coarse filter screening process, Step 2. For those factors identified as limiting factors in the coarse filter, additional analysis occurs at the medium filter screening, as identified below.

- Primarily use aerial imagery, LiDAR, and GIS layers for each tributary habitat limiting factor (function) identified.
- Use medium filter indicators to determine departure (level of risk) from desired conditions using table 147.
- For each coarse filter indicator identified as a limiting factor, use table 146 to determine which indicators to evaluate for medium filter conditions.
- Determine whether conditions are meeting desired conditions using the identified data source in table 147, or other information sources if more appropriate.

- If an indicator is functioning at high level, it is meeting desired conditions. If the indicator is functioning at medium or low level, potential restoration actions are identified in table 148 to assist in moving that indicator toward desired conditions.
- If data suggests indicator is functioning at medium or low level, fine filter may be used to verify field conditions.

Table 147. Stream condition function, indicators, and level of risk

Stream Condition Function	Indicator	Data Source	Desired Condition/ Natural Range	Functioning at High Level	Functioning at Medium Level	Functioning at Low Level
Hydrologic Regime	Water Yield/Peak Flow	GIS layers associated with Nez Perce-Clearwater Approach to Assess Water Yield and Peak Flow	Low potential for alteration in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows	Low potential for alteration in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows	Moderate potential for alteration in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows	High potential for alteration in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows
Sediment Regime	Unstable Slopes/ Intersecting Roads	GIS/LiDar	No roads intersecting with identified unstable slopes	100% of unstable slopes are without intersecting roads	85-100% of unstable slopes are without intersecting roads	75-90% of unstable slopes are without intersecting roads
Sediment Regime	Sediment Impaired - 303d	Idaho 303(d)/305(b) listed - Sediment Impairment	Stream not listed on Idaho 303(d)/305(b) water quality list for sediment	100% of streams not listed on 303(d)/305(b) list for sediment	85-100% of streams not listed on 303(d)/305(b) water quality list for sediment	75-90% of streams not listed on 303(d)/305(b) water quality list for sediment
Sediment Regime	% Pool Fines	PIBO	<25% in spawning habitat	Pool fines equal or less than 25%	Pool fines equal or less than 30%	Pool fines greater than 30%
Sediment Regime	Road/stream crossings	GIS/INFRA	Cross drains are present at road/stream crossings	100 % of road stream crossings are sized for 100-year flow event, cross drains exist	85-100 % of road stream crossings are sized for 100-year flow event, cross drains exist	75-90 % of road stream crossings are sized for 100-year flow event, cross drains exist
Sediment Regime	Motorized Trail Crossings	GIS/INFRA	Trail/Stream crossings exhibit culvert, bridge, or hardened ford	100% of trail/stream crossings exhibit culvert, bridge, or hardened ford	85-100% of trail/stream crossings exhibit culvert, bridge, or hardened ford	75-90% of trail/stream crossings exhibit culvert, bridge, or hardened ford

Stream Condition Function	Indicator	Data Source	Desired Condition/ Natural Range	Functioning at High Level	Functioning at Medium Level	Functioning at Low Level
Sediment Regime	Miles of roads with High modeled sediment delivery risk	GIS/modeling (e.g., GRAIP Lite, WEPP) Needs to be completed for each project	Low sediment delivery risk	100 % of roads modeled with low sediment delivery risk	85-100 % of roads modeled with low sediment delivery risk	75-90 % of roads modeled with low sediment delivery risk
Floodplain Function	Streamside Roads	GIS	No streamside roads within 300 feet of RMZ Category 1 and within 150 feet of RMZ Category 2	100% RMZ have no roads within 300 feet of RMZ Category 1 and within 150 feet of RMZ Category 2	85-100% RMZ have no roads within 300 feet of RMZ Category 1 and within 150 feet of RMZ Category 2	75-90% RMZ have no roads within 300 feet of RMZ Category 1 and within 150 feet of RMZ Category 2
Stream Complexity/Channel Form	Altered stream channel or floodplain (e.g., dredge mined; grazing impacts)	GIS, Aerial Imagery	Low anthropogenic disturbance within floodplain	80-100% of floodplain unaltered by anthropogenic impacts; stream access to floodplain	70-85% of floodplain unaltered by anthropogenic impacts; stream access to floodplain	60-75% of floodplain unaltered by anthropogenic impacts; stream access to floodplain
Stream Complexity/Channel Form	Large Woody Debris	PIBO	Instream channel complexity, large woody debris jams, diverse riparian stands as source of large woody debris	85-100% unconfined channels with diverse riparian timber stands; disturbance regimes to promote recruitment of large woody debris	75-90% unconfined channels with diverse riparian timber stands; disturbance regimes to promote recruitment of large woody debris	65-80% unconfined channels with diverse riparian timber stands; disturbance regimes to promote recruitment of large woody debris
Temperature	NorWeST Stream Temperature	NorWeST Database	Mean August stream temperature <13 degrees C in spawning streams	85-100% streams mean August temperature <13 degrees in spawning streams	75-90% streams mean August temperature <13 degrees in spawning streams	65-80% streams mean August temperature <13 degrees in spawning streams

Stream Condition Function	Indicator	Data Source	Desired Condition/ Natural Range	Functioning at High Level	Functioning at Medium Level	Functioning at Low Level
Temperature	Temperature Impaired - 303d	Idaho 303(d)/305(b) listed - Temperature Impairment	Stream not listed on Idaho 303(d)/305(b) water quality list for temperature	100% of streams not listed on 303(d)/305(b) list for temperature	85-100% of streams not listed on 303(d)/305(b) water quality list for temperature	75-90% of streams not listed on 303(d)/305(b) water quality list for temperature
Temperature	Cooling Processes	Netmap/ LiDar	Stream exhibits reference canopy cover, shade, stream complexity (large woody debris, floodplain inundation)	85-100 % of stream exhibits reference canopy cover, shade, stream complexity (large woody debris, floodplain inundation)	75-90 % of stream exhibits reference canopy cover, shade, stream complexity (large woody debris, floodplain inundation)	65-80 % of stream exhibits reference canopy cover, shade, stream complexity (large woody debris, floodplain inundation)
Connectivity	Aquatic Organism Passage	Field Surveys/GIS/INFRA	Fish bearing streams, no barriers	100% of road stream crossings support migration and movement of aquatic organisms	85-100% of road stream crossings support migration and movement of aquatic organisms	75-90% of road stream crossings support migration and movement of aquatic organisms
Riparian Condition	Riparian plant composition, structure, diversity	GIS - Invasive species treatment areas, human caused alterations (grazing, mining, roads)	Native riparian vegetation species composition, structural and age class diversity unaltered by human caused actions	85-100 % of riparian area exhibits reference native riparian vegetation structure, composition, and age class diversity unaltered by human caused actions in <15% gradient stream segments	75-90% of riparian area exhibits reference native riparian vegetation structure, composition, and age class diversity unaltered by human caused actions in <15% gradient stream segments	65-80 % of riparian area exhibits reference native riparian vegetation structure, composition, and age class diversity unaltered by human caused actions in <15% gradient stream segments

Table 148. Potential stream and riparian restoration actions

Stream Condition Function	Indicator	Potential Stream/Riparian Restoration Actions
Hydrologic Regime	Water Yield/Peak Flow	Reforestation, increase stream complexity, addition of log structures, beaver dam analogs, disconnect road system from stream, install cross drain structures
Sediment Regime	Unstable Slopes/ Intersecting Roads	Disconnect road system from stream, install cross drain structures, relocate roads
Sediment Regime	Sediment Impaired - 303(d)/305(b)	Addition of log structures, beaver dam analogs, boulders, weirs, re-meander straightened stream
Sediment Regime	% Pool Fines	Addition of log structures, beaver dam analogs, boulders, weirs, re-meander straightened stream
Sediment Regime	Road/stream crossings	Replace undersized culverts with structure for 100-year flow, install cross drain structures
Sediment Regime	Motorized Trail Crossings	Hardened ford crossings, trail bridge or culverts at stream crossings
Sediment Regime	Miles of roads with High modeled sediment delivery risk	Road resurfacing, add stream complexity, install woody debris structures
Floodplain Function	Streamside Roads	Add stream complexity, install woody debris structures, road resurfacing
Floodplain Function	Altered stream channel or floodplain (e.g., dredge mined; grazing impacts)	Levee removal, reconnection, or creation of floodplain features, remove mine tailings, fencing, beaver reintroduction, remove or relocate stream side roads
Stream Complexity/Channel Form	Altered stream channel or floodplain (e.g., dredge mined; grazing impacts)	Increase stream complexity, addition of large woody debris, beaver dam analogs, connectivity to side channels; riparian planting, remove or relocate streamside roads
Stream Complexity/Channel Form	Large Woody Debris	Addition of log structures, reintroduce beaver; riparian planting
Temperature	NorWeST Stream Temperature	Riparian planting, addition of log structures, install grade control structure, reintroduce beaver, reconnect floodplain features
Temperature	Temperature Impaired - 303(d)/305(b)	Riparian planting, addition of log structures, install grade control structure, reintroduce beaver, reconnect floodplain features
Temperature	Cooling Processes	Reconnect floodplain, floodplain restoration, beaver reintroduction, add stream complexity
Connectivity	Aquatic Organism Passage	Remove barrier; culvert replacement
Riparian Condition	Riparian plant composition, structure, diversity	Fencing, controlled grazing, riparian planting, remove non-native vegetation, thinning of undesirable understory; prescribed fire

For each indicator that is functioning at medium or low level, map medium filter data against layers identified in Step 1 at the basin and subbasin scale layers (Data layers should be updated annually, but not less than every five years).

- Map layers associated with Nez Perce Clearwater Approach to Assess Water Yield and Peak Flow.
- Map unstable slopes and mass movement areas.
- Review road and trails layer, document segments on unstable ground and within RMZs- especially those that bisect floodplain or constrain stream segments, as these types of roads and trails intercept and constrain potentially negatively influencing other processes like wood and temperature.
- Map road segments that bisect or parallel the floodplain and especially those that continually fail.
- Map Idaho 303(d)/305(b) listed stream segments for sediment and temperature impairments.
- Map pool fines measurements and large wood frequency from PIBO data.
- Review culvert data for blockages and undersized culverts (fish passage culverts under 100-year flow capacity), include on map.
- Document mining claims and grazing allotments, if present.
- Map temperature data from NorWest temperature database.
- Map stream shading estimate.
- Include sediment modeling (e.g., GRAIP Lite, WEPP, or other model as determined by the line officer to be adequate to inform the decision) for roads to help identify high delivery segments and make available to IDT at beginning of project initiation.
- Map invasive species treatment areas and human caused alterations (grazing allotments, mining claims, roads in riparian areas of streams with less than 15 percent gradient.

Step 4: Fine Filter – Field Verification of Conditions & Multiscale Analysis Questions

Initial

- For each indicator not meeting desired conditions (functioning at a medium or low level), ground truth or field verify conditions, if needed.
- Identify whether conditions are caused by direct (e.g., alteration of riparian habitat by grazing) or indirect (e.g., roads impacting water quality and sediment regimes) processes. Review relevant existing habitat data (includes PIBO where available and other subwatershed or reach scale data).
- Determine extent of impact on indicators, using multiscale analysis questions, and use the information to inform restoration/conservation actions in step 5.

Fish Presence/Critical Habitat

- In which reaches are fish present within the project area?
- Is there designated critical habitat within the project area?

Water Quality/Temperature

- What downstream beneficial uses of water exist in the area?

- What beneficial uses are water quality limited in the project area?
- To what extent is the riparian condition affecting stream shading?
- To what extent is canopy cover, stream complexity, and floodplain inundation influencing stream temperatures?

Sediment

- For road decommissioning, what methods of treatment of mass wasting are likely to have the best success in a particular geologic setting? Will road decommissioning reduce mass wasting associated with the road?
- Does the road system cross unstable slopes that may cause mass wasting?
- How and where is the road or trail system hydrologically connected to the stream? How do the connections affect water quality/quantity?
- When building temporary or permanent roads or conducting other ground disturbing activities, evaluate land type erosion hazard potential. Are ground disturbing activities located on high surface erosion areas?

Stream Complexity/Channel Structure

- Is there evidence that past management has altered pool frequency, bank stability, large woody debris availability? Do the stream channels have access to their floodplains?
- How and to what extent are recreation facilities affecting aquatic resources?
- Is there adequate species composition and structural diversity of plant communities to provide thermal regulation, nutrient filtering, large woody debris, and bank stabilization?

Floodplain Function/Connectivity

- How does the road system affect shading, litterfall, and riparian plant communities? To what extent is road sediment entering the stream?
- Streamside roads – are they perpendicular or parallel to the stream
- Are there active mining claims
- Grazing allotments/ impacts

Connectivity/Passage Barriers

- How and where do road-stream crossings influence stream channels and water quality? How and where does the road system restrict the migration and movement of aquatic organisms?
- What aquatic species are affected and to what extent?
- How and where do road-stream crossings influence stream channels and water quality?

Hydrologic Regime

- How and where does the road system exist within the riparian zone? To what extent is the road system impacting hydrologic function?

Riparian Condition

- To what extent is the riparian condition affecting stream shading?

- To what extent are management actions and human caused alterations affecting riparian areas?
- Is there a sufficient source for adequate large woody debris within the floodplain?

Step 5: Identify Conservation/Restoration Actions

Restoration actions address the root causes of degradation using a process-based restoration approach (Booth et al. 2016). Restoration would focus on watershed areas that influence processes that build resilience and sustain rivers and streams. Higher priority is placed on protecting natural functions of watersheds and riverine zones than a single site-specific location.

Potential stream/riparian restoration actions are listed in table 146. This list is not intended to be all inclusive. Other or additional actions may be implemented.

Restoration could be designed to improve stream condition function conditions to the next level (e.g., if stream condition function is functioning at low level, restoration or conservation actions could be designed so that conditions move to functioning at medium level).

Step 6: Effectiveness Monitoring

- Broad-scale monitoring (PIBO Monitoring)
- Measure and evaluate the effectiveness of actions and best management practices at the forest and regional scale.
- Forest Plan monitoring – Refer to Forest Plan Appendix 3.
- For post project monitoring of burn units in riparian management zones, utilize stream condition indicator assessment and/or multiscale analysis to determine if implementation of the project maintained or improved aquatic desired conditions.

Potential Conclusions of Multiscale Analysis

The summary discloses the rationale and scientific context for how multiscale analysis may benefit future project-level decisions. Possible management and analytical approaches may include:

- Identify factors limiting achievement of desired conditions and disclose how project could avoid or at least minimize project activity effects that have a potential to retard attainment of aquatic desired conditions.
- Identify aquatic restoration opportunities and trade-offs with other resource objectives.
- Summarize forest condition and location and identify potential treatments.
- Describe existing species and age composition of the vegetation within RMZs, provide a link between those conditions and stream conditions outside of reference, and thus provide a rationale for proposed treatments.
- Document interaction between proposed project and indicators that are considered limiting.
- Document which indicators are limiting (functioning at either medium or low level), and document evidence and extent of departure from desired condition.
- Summarize results of multiscale analysis questions and reveal how project will reduce impacts through project adjustments or aquatic restoration actions.

- Disclose which aquatic restoration actions will be implemented to avoid retarding progress toward desired conditions and how those actions may improve conditions.

Elk Potential Management Approaches

Potential Management Approaches: Elk

Plan Component(s)

- FW-DC-WLMU-06
- FW-DC-WLMU-07
- MA1-DC-WLMU-01
- MA2-DC-WLMU-01
- MA2-DC-WLMU-02
- MA2-GDL-WL-05
- MA3-DC-WLMU-01
- MA3-GDL-WLMU-01
- MA3-OBJ-WLMU-01

Purpose of Plan Component(s)

Two concepts, nutrition, and habitat use, provide the foundation for managing elk populations on National Forests during spring-fall, encompassing both hunting and non-hunting periods. Land management plan direction is most logically built on these two concepts as best available science to ensure that elk populations are productive and abundant to meet land use desires of a wide spectrum of stakeholders who place high cultural, social, economic, and ecological importance on the species on public lands.

Nutrition is defined as the dietary nutrients needed by a lactating female elk to meet its maintenance needs during summer and fall, a period of nutritional stress in response to demands of a calf at heel. Adequate summer-fall nutrition of a lactating female ensures survival of her calf through winter, and allows the female to be in sufficient condition, after weaning, to again produce and recruit a calf the following year which avoids alternate-year calf production by a female. Nutrition is key to managing productive populations.

Habitat use is defined as the relative probability of elk use of a specified landscape and areas within the landscape. Habitat use is key to achieving the desired distribution of elk. Habitat use is primarily affected by 4 covariates: dietary digestible energy, distance to nearest road open to motorized use by the public, distance to cover-forage edge, and slope. The plan adopted the concepts of nutritional resources and elk habitat use as a framework for management of elk habitats.

The Land Management Plan formalizes these concepts with the desired condition FW-DC-WLMU-06 which is a forest wide desired condition that establishes these two concepts as foundational to habitat management for elk on the Nez Perce-Clearwater National Forest. FW-DC-WLMU-07 describes the desired distribution of elk in the plan area and a desire to allow nutritional resources to be usable by elk. These two desired conditions direct management of elk habitat as an overarching framework. Underneath these two desired conditions are additional desired conditions specific to the needs of elk relative to the three management areas.

In Management Area 1, the intent is to manage elk habitat consistent with activities allowed under the regulations with which they were created. MA1-DC-WLMU-01 establishes that elk habitat conditions in Management Area 1 are primarily established through natural processes. The primary exception being that some important elk winter habitats in wilderness areas have been infested by noxious weeds which has degraded habitat quality for elk within this management area. Without actions, these areas would continue to remain degraded. It is hoped that this desired condition would encourage an effort to reduce or prevent invasive weed infestations in elk habitats in this management area.

Elk Distribution in Management Area 2 is less affected by open roads; however, high quality forage may be lacking. The approach for this management area is to 1) increase high quality forage throughout the MA, and 2) maintain large blocks of habitat without motorized access as described in MA2-DC-WLMU-02 and MA2-GDL-WLMU-01. High quality nutritional resources are created through management to restore the desired conditions described in the terrestrial vegetation plan component tables for the percentages of each broad potential vegetation type in various size classes. It is manifested through targeting up to 50 percent of those restoration treatments towards areas predicted by the forage potential spatial layer to produce the highest quality forage. It would be achieved through means consistent with the regulations with which they were established such as the Idaho Roadless Rule.

Guideline MA2-GDL-WL-05 is intended to prevent excessive fragmentation of habitat in Management Area 2 by motorized access. However, it is explicitly designed to allow some future development of motorized trails in this MA in response to desires from the public to have increased motorized access. This guideline restricts fragmentation of elk habitats to no less than 5,000 acres in size. Thus, when considering new motorized trails in Management Area 2, the proposed route and existing roads may be mapped and buffered by ½ mile, and then the size of the adjacent area without motorized access may be evaluated to determine if they will be larger than 5000 acres after the project is finished. If the adjacent areas are smaller than 5000 acres the new route may be rerouted to maintain 5000-acre blocks without motorized access, or not allowed. Alternatively, other existing motorized routes may be closed to increase the size of the habitat without motorized access to the minimum acreage in order to allow the new route. Where possible new motorized trails may be routed to avoid areas with the highest nutrition potential.

Management Area 3 contains the greatest potential for active management to increase high quality nutrition but also currently has road conditions in many places that may preclude elk habitat use. Management area 3 emphasizes multiple uses including timber harvest, recreation, and mining and mineral extraction, as well as wildlife habitat. Therefore, elk habitat use, and forage are emphasized as important direction for this management area. MA3-DC-WLMU-01 establishes a desired condition to increase the amount of high-quality forage resources usable by elk. High quality nutritional resources are usable by elk when they are located ½ mile or more from open motorized access. In Management Area 3, managers may seek to increase the percent of usable high-quality forage within HUC 12's to achieve 15% or more of the landscape having usable high-quality forage. The percent of high-quality forage usable by elk can be calculated by calculating the amount of high-quality forage present within a HUC 12 watershed using an elk forage layer, subtracting out the amount of high-quality nutritional resources within ½ mile of an open road or motorized trail, and then dividing the area of the high-quality forage by the area of the HUC 12.

MA3-OBJ-WLMU-01 is an objective designed to increase the amount of usable high-quality forage in Management Area 3. Rather than adding acres of treatment to the desired conditions and objectives in the terrestrial vegetation section, the approach instead is to direct the location 20 percent of treatments to restore desired vegetation condition to areas that would produce the high-quality forage as indicated by the elk forage potential layer. At a forest wide scale, habitat treatments to create early seral habitats for elk may not exceed the percentages found in the vegetation desired conditions size class tables which are upon the natural range of variability.

The mechanism under which projects would be evaluated, and by which habitat use and high-quality forage resources would be maintained or improved during project work, is through guideline MA3-GDL-WLMU-01. This guideline requires decisions to maintain or improve predicted percent body fat of female elk at a HUC 12 Scale through the manipulation of four covariates that influence elk habitat use and predicted female percent body fat. Predicted percent body fat ties habitat conditions directly to vital rates of female elk. Vital rates include pregnancy rates, calf production, calf survival, winter survival of female elk, and more. A relatively small increase in forage quality available at the landscape scale to elk in summer and autumn can have strong effects on fat accretion, timing of conception, probability of pregnancy of lactating cows, calf growth, yearling growth, and yearling pregnancy rates. The four covariates are: 1) the amount of high-quality nutritional resources usable by elk, 2) increased distances from open motorized routes during spring through fall, 3) improved habitat use on slopes less than 40 percent, or improved vegetation interspersion. While guideline MA3-GDL-WLMU-01 allows for either the maintenance or improvement in predicted percent body fat, the agencies intent is to improve the predicted percent body fat in most cases by improving one or more of the covariates.

The primary means through which high quality nutritional resources are created involves vegetative disturbance. Natural non-forested habitats also can contribute to the amount of high-quality forage. These habitats can be encroached by forest succession and can be maintained through a combination of active management and natural disturbance. On the Nez Perce-Clearwater, the most effective means to increase high-quality forage is through disturbance to forested habitats, particularly in those areas with higher site potential. Disturbance may include timber harvest, natural fire, prescribed fire, or other activities that reduce canopy cover. Even modest changes in the percent of usable high-quality nutritional resources at a HUC 12 scale increase predicted percent body fat of female elk. Projects may increase or maintain predicted percent body fat of female elk by increasing the amount of high-quality nutritional resources.

Increased distances from open motorized routes during spring through fall may also increase predicted percent body fat of cow elk by increasing the amount of usable space at a HUC 12 scale. Larger areas of usable space may be achieved through increasing the distance to open motorized access. Rather than emphasizing road density under a miles per square mile concept as has been done under elk security, the emphasis here is to maintain or increase space or distance between open motorized roads and trails for elk to use. This will necessitate consideration of both road configuration and distribution and how it affects elk habitat use. Essentially this concept focuses on the gaps between the roads rather than the road density. Active engagement by all stake holders is a strategic approach for managing recreation and wildlife road issues.

Managing for high quality forage away from open motorized access may be created in a variety of ways including closing new roads to the public created during project implementation rather than leaving them open, using prescribed fire or wildfire to create early seral habitats away from open motorized access, re-routing motorized roads or trails away from high quality nutritional resources, prevent the creation of new open motorize access into high quality nutritional resources, helicopter logging, pile and burning by hand crews, or other means. The intent is not to prevent or prohibit new open motorized access or force the obliteration of existing roads, but decisions should carefully consider how road segments might affect the distance between roads relative to nutritional resources were they to be created or left open to the public. It is also not the intent to increase nor require the use of helicopter timber harvest.

Projects can increase elk habitat use by designing openings to decrease distance to forage edge and the distribution of forage resources at a landscape scale. Most elk use of forage occurs within 100 yards of forested edges, and similarly the use of cover is within 300 yards of the edge of open foraging areas. Management to benefit elk may arrange the shape and size of forage and cover patches to increase edges by creating irregularly shaped forage areas with high edge to interior ratios that are interspersed at a landscape scale. Patches of forest retained within openings, can facilitate use of larger openings. The term habitat interspersion used in MA3-GDL-WLMU-01 is meant to capture both the concept of the spatial arrangement of patches at a landscape scale and the cover to forage edges. A mosaic of treated and untreated stands provides optimal nutritional choices for elk across seasons.

Possible Management Strategy and Approach

The following guidance represents potential strategies that may be used to implement plan direction.

FW-MSA-ELK-01. Utilize the reference Draft Rationale, Concepts and Definitions for Elk Management Considerations in the Nez Perce-Clearwater Land Management Plan and Implementation Process (Wisdom 2018), which includes the following analytical steps.

Specify the landscape for evaluation and provide supporting rationale.

Map and evaluate current summer-fall nutrition with a nutrition model (e.g., Models 2, 4, or 6 currently available), summarizing results as to the percentage of the landscape that meets the maintenance needs of lactating female elk. The nutrition analysis could simply commit to use of the nutrition model based on best available science (currently Models 2, 4, or 6), thus allowing for flexibility in use of models over time as models are finalized, further validated, and published.

Overlay the network of roads and trails open to public motorized uses on the nutrition map and establish a distance buffer of at least ½-mile from each open road and trail.

Summarize the percentage of the landscape within the ½-mile buffer that meets maintenance needs of lactating female elk. Reduce the overall percentage of the landscape considered to meet maintenance needs by excluding these areas within the buffer. Results indicate the degree to which human disturbance, via open road and trail effects, reduces or eliminates use of the best nutritional areas (this is a simple version of a habitat use model). More sophisticated habitat use models are likely to be provided over time, and like the nutrition evaluation, language can be placed in the project implementation process to allow for their use as they are developed and published—but that would not diminish the use of a road buffer as outlined here as the first step in habitat use evaluation.

Describe hunter harvest and hunter opportunity objectives for the landscape, as developed with Idaho Department of Fish and Game and Nez Perce Tribe, and how the current landscape condition meets or does not meet those objectives (consideration of elk security but more specifically outlined by defining harvest and hunter opportunity objectives). Consider road closures specific to helping meet these objectives during hunting seasons.

Identify areas within the landscape of highest nutritional capacity and consider directing the use of silviculture or fire management to those areas of highest capacity as part of rationale for any proposed management activities outlined for the project. Use the nutritional capacity map provided to the planning team (it is unlikely to change with continued Clearwater elk research).

Identify specific open roads and trails that might be closed to increased use of best nutritional areas, and that might be closed to meet harvest and hunter opportunity objectives, as specified in collaboration with Idaho Department of Fish and Game and Nez Perce Tribe.

Evaluate management alternatives of silviculture, fire, and roads by repeating analytical steps and evaluating the changes in nutrition, habitat use, and harvest/hunter opportunity relative to current condition.

Potential Management Approaches: Grizzly Bear

Plan Component(s)

FW-GL-WL-01
FW-DC-WL-06.
FW-DC-WL-07
FW-DC-WL-08
FW-DC-WL-09
MA2-GDL-WL-01.

Purpose of Plan Component(s)

FW-GL-WL-01 acknowledges and supports interagency coordination as a critical part of recovery of listed species. Engaging with Federal, State, and Tribal partners will lead to better informed decisions, products and ultimately lead to a higher chance of recovery success.

FW-DC-WL-06 to FW-DC-WL-09 are fine filter plan components to support recovery of Grizzly Bear in the Bitterroot Ecosystem at the land management plan level and successful migration to the Bitterroot Recovery Zone. These plan components work with the integrated course filter plan components described in the **Plan components that contribute to ecological conditions for grizzly bears section of the biological assessment** and the land allocation decisions, described below, to guide the Forest's actions over the life of the plan to support colonization, persistence, and recovery of grizzly bear within the Bitterroot Recovery Area.

Land Allocations were developed to consider several different broad management concepts that limited human use and access as ways to provide the large tracts of land to support grizzly bear movement and recovery. These allocation types include Recommended Wilderness Areas, Suitable Wild and Scenic Rivers, Idaho Roadless Areas, and suitability determinations designating non-motorized settings in the recreation opportunity spectrum. In these areas, road construction is prohibited with very few exceptions. In consideration of grizzly bears, land allocations and designations were deliberately overlayed and overlapped in such a way as to provide a corridor for travel from the northern boundary of the Forest on the Bitterroot Divide to the Selway Bitterroot Recovery Area. Specifically, the Mallard-Larkin and Hoodoo Recommended Wilderness Areas are connected along the northern boundary of the Forest, by a chain of roadless areas including Meadow Creek-Upper North Fork, and Rawhide that are non-motorized in the Summer. From this northern boundary of the Forest, a path south to the Bitterroot Recovery Area was also allocated and given a non-motorized ROS setting, through these various designations and determinations. This route includes the Hoodoo Recommended Wilderness Area, the eastern portion of the Bighorn-Weitas, the Weir-Post Office Creek, and western portion of the Lochsa Face roadless areas as well as the Sneakfoot Meadows roadless area. Also within this path are a number of rivers with additional protections, including the Lochsa Wild and Scenic River and several rivers found suitable as wild and scenic rivers including Kelly Creek and the 3 main tributaries of Kelly Creek, Cayuse Creek and Colt Killed Creek. To the west of this main path lies a large contiguous matrix of Idaho Roadless Rule Areas that also prohibits road construction, though some summer motorized travel on trails may be permitted in the future. In total, these land allocations, designations and determinations provide a large, contiguous swath of largely unroaded forested landscape for grizzly bears to travel through. This is an area that generally follows the movement of grizzly bears that have ventured onto the Forest in the past.

The purpose of MA2-GDL-WL-02 is to ensure there are large unroaded areas for wide ranging wildlife species. This guideline constrains travel planning decisions within Idaho Roadless Rule Areas and other MA2 lands (outside Community protection areas). Road construction is generally prohibited in Idaho Roadless Rule Areas and this guideline does not further restrict nor modify the Roadless Rule. This guideline does not prohibit motorized travel but does put restrictions on how much additional motorized travel could be allowed in future travel plans. This guideline tempers the number of new motorized trails that could be constructed in the future, and in particular impacts large roadless areas, such as the western portion of Bighorn -Weitas, Pot Mountain, Moose Mountain, Siwash and North Lochsa Slope roadless areas. These roadless areas will be relatively free of motorized use and are additional to and connected with the land allocations described above. The intent of this guideline is to ensure large blocks of secure habitat exists in the future for a variety of wildlife species.

Possible Management Strategy and Approach

FW-MSA-WL-01. The Nez Perce-Clearwater participates as a member of the Bitterroot Ecosystem subcommittee, or an equivalent interagency science-based committee, to understand best available science and best practices regarding Grizzly Bears in the Bitterroot Ecosystem and support recovery in the Bitterroot Recovery Area.

FW-MSA-WL-02. Avoidance and minimization measures and conservation recommendations may be utilized to minimize negative impacts to grizzly bears and promote recovery. Updated scientific information or recommendations by the Bitterroot Ecosystem Subcommittee, are incorporated into project planning when applicable.

FW-MSA-WL-03. Interagency Grizzly Bear Committee recommendations for sanitation plans, infrastructure and reducing attractants may be implemented within and outside recovery areas to reduce grizzly bear-human conflict.

FW-MSA-WL-04. When conducting travel planning analysis, the FWS and the Forests consider connectivity for Grizzly Bear at a site-specific scale. This could include measures and actions to reduce human-bear conflict and reduce impacts to current bear security.

FW-MSA-WL-05. The Forests continue to collaborate with and follow direction of the FWS regarding management, project level analysis and consultation for Grizzly Bear.

Appendix B. Land Management Plan (Proposed Action)

SEE ATTACHED LAND MANAGEMENT PLAN

Appendix C. Conservation Watershed Network Watersheds

Table 149 provides a list of all proposed Conservation Watershed Network watersheds within the plan area.

Table 149. List of all proposed Conservation Watershed Network watersheds within the plan area

HUC 8	HUC 10	HUC 12	HUC 12	Acres
Middle Salmon-Chamberlain	Sabe Creek	Upper Sabe Creek	170602070402	14,313
Middle Salmon-Chamberlain	Sabe Creek	Lower Sabe Creek	170602070403	7,599
Middle Salmon-Chamberlain	Bargamin Creek	Upper Bargamin Creek	170602070601	23,079
Middle Salmon-Chamberlain	Bargamin Creek	Middle Bargamin Creek	170602070602	22,605
Middle Salmon-Chamberlain	Bargamin Creek	Lower Bargamin Creek	170602070603	24,216
Middle Salmon-Chamberlain	Wind River	Anchor Creek-Wind River	170602071002	23,692
Lower Salmon River	Slate Creek	Upper Little Slate Creek	170602090301	25,524
Lower Salmon River	Slate Creek	Lower Little Slate Creek	170602090302	15,873
Lower Salmon River	Slate Creek	Lower Slate Creek	170602090304	26,281
Lower Salmon River	White Bird Creek	South Fork White Bird Creek	170602090601	22,414
Lower Little Salmon River	Rapid River	West Fork Rapid River	170602100403	10,770
Lower Little Salmon River	Rapid River	Shingle Creek-Rapid River	170602100404	12,963
Upper Selway River	Running Creek	Upper Running Creek	170603010501	24,353
Upper Selway River	Running Creek	Lower Running Creek	170603010503	12,403
Upper Selway River	Bear Creek	Upper Bear Creek	170603010602	17,999
Upper Selway River	Bear Creek	Paradise Creek	170603010604	21,317
Upper Selway River	Bear Creek	Middle Bear Creek	170603010605	16,436
Upper Selway River	Bear Creek	Lower Cub Creek	170603010606	18,197
Upper Selway River	Bear Creek	Lower Bear Creek	170603010607	9,744
Upper Selway River	Bear Creek	Elk Creek-Selway River	170603010703	11,172
Lower Selway River	Moose Creek	Upper East Fork Moose Creek	170603020102	22,439
Lower Selway River	Moose Creek	Middle East Fork Moose Creek	170603020104	30,745
Lower Selway River	Moose Creek	Middle North Fork Moose Creek	170603020107	10,675
Lower Selway River	Moose Creek	Rhoda Creek	170603020108	36,382
Lower Selway River	Moose Creek	Lower North Fork Moose Creek	170603020109	17,568
Lower Selway River	Moose Creek	Lower East Fork Moose Creek	170603020110	29,497
Lower Selway River	Moose Creek	Moose Creek	170603020111	11,509
Lower Selway River	Moose Creek	Marten Creek	170603020201	20,987
Lower Selway River	Meadow Creek	Headwaters Meadow Creek	170603020301	24,067
Lower Selway River	Meadow Creek	Upper Meadow Creek	170603020302	22,345
Lower Selway River	Meadow Creek	Middle Meadow Creek	170603020304	33,220
Lower Selway River	Meadow Creek	Buck Lake Creek	170603020305	20,738
Lower Selway River	Meadow Creek	Lower Meadow Creek	170603020307	31,587

HUC 8	HUC 10	HUC 12	HUC 12	Acres
Lower Selway River	Lower Selway River	O'hara Creek	170603020404	37,882
Lochsa River	Crooked Fork Creek	Spruce Creek	170603030102	15,876
Lochsa River	Crooked Fork Creek	Lower Brushy Fork	170603030103	25,819
Lochsa River	Crooked Fork Creek	Upper Crooked Fork	170603030104	19,434
Lochsa River	Crooked Fork Creek	Fox Creek-Boulder Creek	170603030105	16,021
Lochsa River	Crooked Fork Creek	Lower Crooked Fork	170603030106	21,097
Lochsa River	Colt Killed Creek	Upper Colt Killed Creek	170603030203	24,735
Lochsa River	Colt Killed Creek	Colt Creek	170603030205	16,645
Lochsa River	Colt Killed Creek	Storm Creek	170603030207	32,678
Lochsa River	Colt Killed Creek	Lower Colt Killed Creek	170603030208	21,055
Lochsa River	Upper Lochsa River	Walton Creek-Lochsa River	170603030301	18,806
Lochsa River	Upper Lochsa River	'Imnamatnoon Creek	170603030302	13,218
Lochsa River	Upper Lochsa River	Waw'aalamnime Creek	170603030303	17,197
Lochsa River	Upper Lochsa River	Wendover Creek-Lochsa River	170603030304	20,722
Lochsa River	Warm Springs Creek	Lower Warm Springs Creek	170603030403	19,438
Lochsa River	Middle Lochsa River	Postoffice Creek	170603030501	12,184
Lochsa River	Middle Lochsa River	Weir Creek-Lochsa River	170603030503	33,200
Lochsa River	Middle Lochsa River	Stanley Creek-Lochsa River	170603030504	31,574
Lochsa River	Fish Creek	Upper Fish Creek	170603030601	23,240
Lochsa River	Fish Creek	Hungery Creek	170603030602	22,676
Lochsa River	Fish Creek	Lower Fish Creek	170603030603	10,396
Lower Clearwater	Clear Creek	South Fork Clear Creek	170603040101	16,530
Lower Clearwater	Sutler Creek	Suttler Creek-Middle Fork Clearwater River	170603040203	4,161
Lower Clearwater	Lolo Creek	Upper Lolo Creek	170603060201	26,820
Lower Clearwater	Potlatch River	East Fork Potlatch River	170603060801	5,353
Lower Clearwater	Potlatch River	Hog Meadow Creek-Potlatch Creek	170603060902	9,327
South Fork Clearwater River	Red River	South Fork Red River	170603050101	24,140
South Fork Clearwater River	Red River	Upper Red River	170603050102	32,001
South Fork Clearwater River	Red River	Middle Red River	170603050103	23,120
South Fork Clearwater River	Red River	Lower Red River	170603050104	22,986
South Fork Clearwater River	American River	Upper American River	170603050201	14,397

HUC 8	HUC 10	HUC 12	HUC 12	Acres
South Fork Clearwater River	Crooked River	Upper American River	170603050301	28,631
South Fork Clearwater River	Crooked River	Lower Crooked River	170603050302	16,327
South Fork Clearwater River	Newsome Creek	Upper Newsome Creek	170603050401	24,512
South Fork Clearwater River	Newsome Creek	Lower Newsome Creek	170603050402	18,040
South Fork Clearwater River	Upper South Fork Clearwater River	Whiskey Creek-South Fork Clearwater River	170603050501	10,503
South Fork Clearwater River	Upper South Fork Clearwater River	Leggett Creek-South Fork Clearwater River	170603050502	15,380
South Fork Clearwater River	Upper South Fork Clearwater River	Tenmile Creek	170603050503	34,340
South Fork Clearwater River	Johns Creek	Upper Johns Creek	170603050601	30,790
South Fork Clearwater River	Johns Creek	Lower Johns Creek	170603050603	26,142
South Fork Clearwater River	Middle South Fork Clearwater River	Mill Creek	170603050701	23,454
South Fork Clearwater River	Middle South Fork Clearwater River	Meadow Creek	170603050702	24,017
Upper North Fork Clearwater River	NF Clearwater - Lake Creek	Meadow Creek	170603070101	16,203
Upper North Fork Clearwater River	NF Clearwater - Lake Creek	Long Creek	170603070102	17,909
Upper North Fork Clearwater River	NF Clearwater - Lake Creek	Vanderbilt Gulch-North Fork Clearwater River	170603070103	34,089
Upper North Fork Clearwater River	NF Clearwater - Lake Creek	Lake Creek	170603070104	22,051
Upper North Fork Clearwater River	Cayuse Creek	Upper Cayuse Creek	170603070201	28,914
Upper North Fork Clearwater River	Kelly Creek	Middle Fork Kelly Creek	170603070401	26,217

Appendix D. Aquatic and Riparian Monitoring Excerpts from Appendix 3: Monitoring Plan

Water and Aquatic Resources (WTR)

*2012 Planning Rule required questions element 1-8 [36 CFR 219.12(a)(5)] or (FSH 1909.12 Section 32.13f)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
FW-GL-WTR-02. The Nez Perce-Clearwater builds and maintains partnerships to fund and implement projects that result in improved water quality and watershed and stream conditions. **FW-GL-WTR-03.** The Nez Perce-Clearwater works with partners to improve aquatic habitat, increase resiliency, and enhance ecological integrity by improving habitat for beaver where appropriate. **FW-GL-CWN-01.** The Nez Perce-Clearwater works with the Nez Perce Tribe, State of Idaho, National Marine Fisheries Service, U. S. Fish and Wildlife Service, and other governmental organizations to plan and implement projects that contribute to recovery goals for aquatic species listed under the Endangered Species Act and their designated critical habitat, such that protective measures under the Act are no longer necessary. **FW-GL-CWN-02.** The Nez Perce-Clearwater partners with federal agencies, including Section 7 consultation, as required; state agencies; tribes; counties; interested groups; and interested private landowners to recover threatened and endangered species.	**MON-WTR-01** What is the status of partnerships? * (i)(ii)(vii) and Social, economic, and cultural sustainability	**Partnerships** • *Number and types of partners* • *Type and amount of aquatic restoration projects completed through partnerships* • *Type and amount of aquatic restoration projects completed through partnerships to aid in the recovery of Endangered Species Act listed species*	Supervisor's Office Records WIT (annual)
FW-DC-WTR-01. National Forest System lands provide the distribution, diversity, and complexity of watershed and landscape-scale features including natural disturbance regimes and the aquatic and riparian ecosystems to which species, populations, and communities are uniquely adapted. Watersheds and associated aquatic ecosystems retain their inherent resilience to respond and adjust to disturbances, including climate change, without long-term, adverse changes to their physical or biological integrity. **FW-DC-WTR-07**. Instream flows are sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows are retained. Stream flow regimes maintain riparian ecosystems and	**MON-WTR-02** What is the status and trend of watershed condition and resiliency and what management actions have been designed and implemented to contribute to this status? *(i)(ii)(iv)(vi)(vii)	**Watershed Condition and Resilience** • *Amount, type, and locations of actions completed in WCF priority watersheds as identified in watershed restoration action plans (WRAP), including the identification of the watershed condition class (WCC) indicator(s) the project improved* • *Status and trend of PIBO overall index values comparing managed*	PIBO INFRA WIT WCATT NEPA decision documents

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
natural channel and floodplain dimensions. Stream channels transport sediment and woody material over time while maintaining reference dimensions (e.g., bankfull width, depth, entrenchment ratio, slope, and sinuosity). **FW-DC-WTR-08.** Groundwater dependent ecosystems, including peatlands, bogs, fens, wetlands, seeps, springs, riparian areas, groundwater-fed streams and lakes, and groundwater aquifers, persist in size and seasonal and annual timing and exhibit water table elevations within the natural range of variability. Surface and groundwater flows provide late-season stream flows, cold water temperatures, and sustain the function of surface and subsurface aquatic ecosystems. **FW-OBJ-WTR-01.** Complete the actions identified in watershed restoration action plans for priority watersheds as identified under the Watershed Condition Framework process every 15 years.		*sites to reference sites, by Forest and Subbasin.* • *Number and type of climate change adaptation strategies incorporated into project development* • *Number of decisions that included project specific design features to limit impacts to flow regimes* • *Number, type, amount, and locations of restoration actions to maintain or restore subsurface flows for groundwater dependent ecosystems*	
FW-DC-WTR-02. Spatial connectivity exists within or between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact habitat refugia. These network connections provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic, riparian-associated, and many upland species of plants and animals. **FW-DC-WTR-10.** Critical habitat components (primary biological features) provide the ecological conditions necessary to achieve species recovery. Spawning, rearing, and migratory habitats are widely available and inhabited. Listed aquatic species have access to historic habitat and appropriate life history strategies (e.g., bull trout resident, fluvial, adfluvial, and anadromy) are supported. **FW-OBJ-WTR-04.** Reconnect 10 to 20 miles of habitat in streams every 5 years where where passage barriers created by roads or culverts are limiting the distribution of fish or other aquatic species of concern. **FW-OBJ-RMZ-01.** Improve 300 to 700 acres of riparian habitat every 5 years, through improvements that are intended to meet desired conditions for RMZs, such as road obliteration, riparian planting, hardwood restoration, post assisted log structures, beaver dam analogs, and reconnecting floodplains by removing road prisms or berms.	**MON-WTR-03** What management actions have been designed and implemented to contributed to the maintenance or improvement of hydrologic connectivity and aquatic habitat connectivity? *(ii)(iv)(vi)	**Connectivity** • *Acres or miles of restoration activities targeted towards reconnection of aquatic habitat and hydrologic connectivity* • *Number of aquatic organism passage (AOPs) culverts or bridges installed, or fish passage barriers removed* • *Miles of habitat opened above fish passage barrier crossings* **Climate Change Adaptation** • *Number and type of climate change adaptation strategies incorporated into project development*	INFRA WIT (annual)
FW-DC-WTR-03. Aquatic habitats contribute to ecological conditions capable of supporting self-sustaining populations of native species	**MON-WTR-04**	**Aquatic Habitat**	PIBO

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
and diverse plant, invertebrate, and vertebrate aquatic and riparian-dependent species. Aquatic habitats are key contributors to for the recovery of threatened and endangered fish species and provide important habitat components for all native aquatic species. **FW-DC-WTR-04.** Instream habitat conditions for managed watersheds move in concert with or towards reference conditions. Aquatic habitats are diverse, with channel characteristics and water quality reflective of the climate, geology, and natural vegetation of the area. Instream habitat conditions across the forest, such as large woody material, percent pools, residual pool depth, median particle size, and percent fines are within reference ranges as defined by agency monitoring (e.g., PIBO) and match the frequency distribution of comparable reference sites for a given channel type, channel size, climate, and geomorphic setting. **FW-DC-WTR-06.** Sediment delivery to streams is of the types, quantities, and rates that support the natural instream sediment transport and storage rates and instream sediment substrate composition. The sediment regime in water bodies is not chronically affected by management activities to the extent that the availability of functioning spawning areas and interstitial spaces are reduced. **FW-DC-WTR-10.** Critical habitat components (primary biological features) provide the ecological conditions necessary to achieve species recovery. Spawning, rearing, and migratory habitats are widely available and inhabited. Listed aquatic species have access to historic habitat and appropriate life history strategies (e.g., bull trout resident, fluvial, adfluvial, and anadromy) are supported. **FW-DC-WTR-11.** Water cooling mechanisms in unconfined channels that are dependent on the exchange of surface water and groundwater are functioning at full potential. Cooling mechanisms include dynamic scouring and bar formation, activation of side channels during high flow events, and inundation of the full floodplain extent during floods with an approximate 5 to 10-year return interval. **FW-DC-CWN-02.** Streams within the Conservation Watershed Network provide habitat that supports robust native fish populations, which can expand to and recolonize adjacent unoccupied habitats. These areas conserve key demographic processes likely to influence the sustainability of aquatic species. **FW-OBJ-WTR-02.** Enhance or restore 50-100 miles of stream habitat within unconfined channels every 5 years to maintain or restore structure, composition, and function of habitat for fisheries	What is the status and trend of aquatic habitat, stream complexity, and floodplain processes and the management actions that have been designed and implemented to contribute to this status? *(i)(ii)(iv)(vii)	• *Status and Trend in measured stream metrics collected primarily through Pacfish/Infish Biological Opinion monitoring and summarized at the subbasin and Forest scale (residual pool depth, pool percent, median substrate size (D50), pool fines, wood frequency, bank angle, aquatic macroinvertebrates)* • *Amount and types of restoration activities targeted towards improvement of aquatic habitat, stream complexity, channel structure, and side channel and floodplain conditions* • *Amount and types of projects to increase thermal refugia and improve wetland/floodplain function (e.g., relocating roads located in meadows and floodplains to keep subsurface flow for as long as possible before it enters the stream channel)* • *Number, type, and locations of aquatic invasive species occurrences*	(5 years) Forest, partner data (annual, by project)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
and other aquatic species in streams with legacy effects that caused channels to become straightened or incised, impaired beaver habitat, or diminished floodplain capacity. Activities include, but are not limited to, berm removal, large woody debris placement, streamside road decommissioning, riparian planting, beaver dam analogs, and process-based restoration/floodplain restoration. **FW-OBJ-WTR-03.** Enhance or restore stream habitat on 5 miles, every 5 years, in naturally confined channels to maintain or restore step pool structure, composition, and function of habitat for fisheries and other aquatic species. Activities include, but are not limited to improving stream complexity, large wood debris or boulder placement, and riparian planting.			
FW-DC-WTR-05. Water quality, including groundwater, meets or exceeds applicable state water quality standards, fully supports designated beneficial uses, and is of sufficient quality to support surrounding communities, municipal water supplies, and natural resources. The Forest has no documented lands or areas that are delivering water, sediment, nutrients, and/or chemical pollutants that would result in conditions that violate the State of Idaho's water quality standards. **FW-STD-WTR-06**. To restore watersheds, management activities in watersheds with approved total maximum daily loads shall be designed to comply with the total maximum daily load allocations following project implementation.	**MON-WTR-05** What is the status and trend of water quality? *(i)(ii)	**Water Quality** • *Number and locations of stream reaches by subbasin listed as impaired in the IDEQ 303(d)/305(b) integrated report* • *Miles of 303(d) listed waters* • *Miles of waters under an approved total maximum daily load (TMDL) plan* • *List of projects (acres, miles, types) completed that contributed to delisting 303(d) listed waters and/or contributed to meeting TMDLs*	Idaho Department of Environmental Quality 303(d)/ 305(b) integrated report (2 years) WIT INFRA (annual)
FW-OBJ-TE-01. Restore hardwood overstory and understory species or allow disturbance processes, such as fire or other disturbance, on 3,000 to 4,200 acres of riparian areas every 5 years. **FW-OBJ-WTR-01.** Complete the actions identified in watershed restoration action plans for 15 priority watersheds as identified under the Watershed Condition Framework process every 15 years. **FW-OBJ-WTR-02.** Enhance or restore 50-100 miles of stream habitat within unconfined channels every 5 years to maintain or restore structure, composition, and function of habitat for fisheries and other aquatic species in streams with legacy effects that caused channels to become straightened or incised, impaired beaver habitat, or diminished floodplain capacity. Activities include, but are not limited to, berm removal, large woody debris placement, streamside	**MON-WTR-06** Are watershed and aquatic restoration projects being implemented at a rate consistent with Land Management Plan objectives? *(i)(ii)(iv)(vii)	**Watershed and Aquatic Restoration** • *Comparison of aquatic and riparian restoration objectives implemented to other Land Management Plan objectives* • *Number, type, and location of watershed and aquatic restoration projects implemented*	NEPA decision documents INFRA WIT (annual)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
road decommissioning, riparian planting, beaver dam analogs, and process-based restoration/floodplain restoration. **FW-OBJ-WTR-03.** Enhance or restore stream habitat on 5 miles, every 5 years, in naturally confined channels to maintain or restore step pool structure, composition, and function of habitat for fisheries and other aquatic species. Activities include, but are not limited to improving stream complexity, large wood debris or boulder placement, and riparian planting. **FW-OBJ-WTR-04.** Reconnect 10 to 20 miles of habitat in streams every 5 years where where passage barriers created by roads or culverts are limiting the distribution of fish or other aqutic species of concern. **FW-OBJ-WTR-05**. Improve soil and watershed conditions on 3,000-4,000 acres every 5 years, emphasizing actions in priority watersheds and Conservation Watershed Network watersheds. This includes non-system road decommissioning. **FW-OBJ-RMZ-01.** Improve 300 to 700 acres of riparian habitat every 5 years, through improvements that are intended to meet desired conditions for riparian management zones, such as road obliteration, riparian planting, hardwood restoration, post assisted log structures, beaver dam analogs, and reconnecting floodplains by removing road prisms or berms. **FW-OBJ-CWN-01.** Conservation Watershed Networks are the highest priority for restoration actions for native fish and other aquatic species. Assess 500 miles of roads every 5 years to identify those roads, regardless of maintenance level, that may negatively impact streams, such as contributing excessive sediment or altering riparian areas or floodplains. **FW-OBJ-CWN-02.** Stormproof 15 percent of roads in Conservation Watershed Network prioritized for restoration every 5 years as funding allows to benefit threatened and endangered aquatic species and municipal watersheds. Emphasize roads with greatest risk of erosion and road prism failure, including maintenance level 1 and 2 roads.**FW-OBJ-ARREC-01.** Remove, relocate, or mitigate two existing dispersed recreation sites, outside of riparian management zones every 5 years. **FW-OBJ-INF-01.** Complete 600 miles of road work, such as reconstruction; re-routing; road improvements; decommissioning; or placing roads in intermittent stored service, every 5 years. Priorities shall include reducing effects on desired aquatic and riparian conditions from chronic sediment delivery or potential future road			

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
prism failures, including previously decommissioned roads where drainage features have failed.**FW-OBJ-INF-02**. Annually maintain 1,400 miles of operational maintenance level 2 through 5 roads. **FW-OBJ-REC-01.** Annually maintain to standard a minimum of 30 percent of National Forest System trail miles. **FW-OBJ-REC-02.** Reduce deferred maintenance of trails by five percent, every five years.			
FW-STD-WTR-02. Project-specific best management practices (BMPs), including both Federal and state BMPs, shall be incorporated into project planning as a principal mechanism for controlling non-point pollution sources, to meet soil and watershed desired conditions, and to protect beneficial uses.	**MON-WTR-07** Are appropriate BMPs incorporated in project decision documents? *(i)(vii)	**Best Management Practices** • *Number of decisions affecting water, fisheries, and aquatic ecosystems* • *Number of decisions affecting water, fisheries, and aquatic ecosystems that included appropriate BMPs* • *Number and types of design features or BMPs incorporated into project decisions to increase the potential for attainment of aquatic and riparian desired conditions* • *Summary of biennial National Core BMP monitoring audits*	NEPA decision documents National Core BMP Monitoring database (annual)
FW-STD-WTR-04. Where aquatic and riparian desired conditions are being achieved, projects shall maintain those conditions. Where aquatic and riparian desired conditions are not yet achieved, and to the degree that project activities would contribute to those conditions, projects shall restore or not retard attainment of desired conditions. Short term adverse effects from project activities may occur when they support the long-term recovery of aquatic and riparian desired conditions and federally listed species. Exceptions to this standard include situations where Forest Service authorities are limited (1872 Mining Law, state water right, etc.). In those cases, project effects shall not retard attainment of desired conditions for watersheds, to the extent possible within Forest Service authorities.	**MON-WTR-08** What management actions are contributing to the attainment of aquatic and riparian desired conditions?*(i)(ii)(iv)(vi)(vii) **MON-WTR-09** Has attainment of aquatic and riparian desired conditions been retarded by management actions?	**Aquatic and Riparian Desired Conditions** • *Number of decisions affecting water, fisheries, and aquatic ecosystems* • *Number of decisions affecting water, fisheries, and aquatic ecosystems that included restoration actions to move towards aquatic and riparian desired conditions.* • *Within decisions, the type and amount of restoration actions that move towards aquatic and riparian desired conditions*	NEPA decision documents (annual)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
	*(i)(ii)(iv)(vii)	• *Within decisions, types of design features or BMPs incorporated to increase the potential for attainment of aquatic and riparian desired conditions* • *Number of decisions that utilized the Stream Conditions Indicator Assessment and/or multiscale analysis* • *Number of stream condition indicator assessment or multiscale analysis findings that indicate aquatic conditions improved or did not retard attainment of aquatic and riparian desired conditions.* **Climate Change Adaptation** • *Number and type of climate change adaptation strategies incorporated into project development*	

Conservation Watershed Network (CWN)

*2012 Planning Rule required questions element 1-8 [36 CFR 219.12(a)(5)] or (FSH 1909.12 Section 32.13f)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
FW-DC-CWN-03. Roads in the Conservation Watershed Network present minimal risk to aquatic resources. **FW-STD-ARINF-07.** In the Conservation Watershed Network and HUC12 subwatersheds with Endangered Species Act critical habitat or listed aquatic species, when constructing or reconstructing roads, projects shall result in a net decrease in the hydrologic connectivity of the road system and stream channel network. Treatment priority shall be given to roads or road segments that pose the greatest relative ecological risk to riparian and aquatic ecosystems. The net decrease is measured by project area. **FW-OBJ-CWN-01.** Conservation Watershed Networks are the highest priority for restoration actions for native fish and other aquatic	**MON-CWN-01** What management actions have been designed and implemented to contribute to reduced impacts of system roads on aquatic resources in CWNs? *(i)(ii)(iv)(vii)	**Roads in CWN** • *Length of system road that affect hydrologic function in CWN watersheds where system road construction or reconstruction occurred, specifically in subwatersheds with Endangered Species Act critical habitat for aquatic species or containing listed aquatic species.* • *Miles of road storm-proofed in CWN watersheds*	INFRA WIT (annual)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
species. Assess 500 miles of roads every 5 years to identify those roads, regardless of maintenance level, that may negatively impact streams, such as contributing excessive sediment or altering riparian areas or floodplains. **FW-OBJ-CWN-02.** Stormproof 15 percent of roads in Conservation Watershed Network prioritized for restoration every 5 years as funding allows to benefit threatened and endangered aquatic species and municipal watersheds. Emphasize roads with greatest risk of erosion and road prism failure, including maintenance level 1 and 2 roads.	**MON-CWN-02** Is progress being made towards reducing road impacts that are near streams supporting ESA listed fish as described in objectives FW-CWN-OBJ-01 and FW-CWN-OBJ-02?	• *Miles and location of roads treated that are near streams supporting ESA listed fish (decomission, intermittent stored service, reconstruction, road improvement, stormproofing, etc.)* • *Miles, maintenance level, and locations of roads assessed* • *Amount of net decrease in hydrologic connectivity of the road system in CWN watersheds by project area if road construction or reconstruction actions have been implemented*	
FW-DC-CWN-01. Conservation Watershed Networks have functionally intact ecosystems that provide high-quality water and contribute to and enhance the conservation of aquatic species of conservation concern and recovery of threatened or endangered fish species. **FW-STD-CWN-01**. In Conservation Network Watersheds not meeting aquatic and riparian desired conditions, activities shall be designed and implemented in a manner that supports, and/or contributes towards the recovery of federally listed species and the achievement of these desired conditions and does not retard them when evaluated at the HUC12 subwatershed scale. Short term adverse effects from project activities may occur when they support the long-term recovery of aquatic and riparian desired conditions and federally listed species.	**MON-CWN-03** What management actions have been implemented and designed to contribute to the attainment of aquatic and riparian desired conditions and recovery of federally listed species in CWNs? *(i)(ii)(iv)(vi)(vii) **MON-CWN-04** Has attainment of aquatic and riparian desired conditions been retarded by management actions within the Conservation Watershed Network? *(i)(ii)(iv)(vii)	**Aquatic and Riparian Desired Conditions** • *Number of decisions with activities located within CWN that incorporated Multiscale Analysis and the Stream Conditions Indicator Assessment* • *Number, types, and amount of restoration actions occurring in CWNs to move towards aquatic and riparian desired conditions or contribute to the recovery of federally listed species* • *Number and types of design features or BMPs incorporated into projects occurring within CWNs to increase the potential for attainment of aquatic and riparian desired conditions or contribute to the recovery of federally listed species* • *Number of stream condition indicator assessment or multiscale analysis findings that indicate aquatic conditions improved or did not retard attainment of aquatic and riparian desired conditions within*	NEPA decision documents WIT INFRA (annual) Results of project level multi-scale analysis and stream condition indicator assessments within the Conservation Watershed Network (annual)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
		the Conservation Watershed Network. **Climate Change Adaptation** • *Number and type of climate change adaptation strategies incorporated into project development*	

Riparian Management Zones (RMZ)

*2012 Planning Rule required questions element 1-8 [36 CFR 219.12(a)(5)] or (FSH 1909.12 Section 32.13f)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
FW-DC-RMZ-01. RMZs reflect a natural composition of native flora and fauna and a distribution of physical, chemical, and biological conditions as compared to reference conditions. The species composition and structural diversity of native plant communities in riparian management zones provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration. Nutrients, large woody debris, and fine particulate organic matter are supplied in amounts and distributions sufficient to sustain physical complexity and stability. **FW-DC-RMZ-02.** RMZs feature key riparian processes and conditions that function consistent with local disturbance regimes, including slope stability and associated vegetative root strength, wood delivery to streams and within the RMZs, input of leaf and organic matter to aquatic and terrestrial systems, solar shading, microclimate, and water quality.	**MON-RMZ-01** What activities have occurred in riparian management zones? *(i)(ii)(iv)(vii) **MON-RMZ-02** Has attainment of aquatic and riparian desired conditions been retarded by management actions within the Riparian Management Zone? *(i)(ii)(iv)(vii)	**Riparian Condition** • *Locations, acres, and types of actions occurring with RMZs* • *Acres of RMZs improved through activities, including but not limited to, streamside road decommissioning, riparian planting, reconnecting floodplains, prescribed fire, hardwood restoration, and installation of post assisted log structures and beaver dam analogs* • *Miles of road decommissioned, relocated, or storm-prooofed within RMZs and number of road/stream crossings removed* See also 1.11 Aquatic and Riparian Livestock Grazing (ARGRZ), MON-ARGRZ-02; 1.1 Terrestrial Ecosystems (TE), MON-TE-03; and 1.3 Meadows, Grasslands, and Shrublands (GS), MON-MGS-01	WIT INFRA FACTS NRM (annual)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
FW-STD-RMZ-01. Vegetation management shall only occur in riparian management zones from the edges of the active stream channel to within 150 feet within Riparian Management Zone Category 1 and to the edges of the active stream channel to 100 feet within Riparian Management Zone Category 2, 3, and 4 to restore or enhance aquatic and riparian-associated resources. Non-mechanical treatments, e.g., hand fuel treatments, prescribed fire, small diameter (e.g., sapling, pole) conifer thinning, may be authorized if aquatic and riparian-associated resources are maintained. Timber Harvest in this zone shall leave trees on site or use for aquatic restoration. Vegetation management may occur in the outer Riparian Management Zones to meet desired conditions for fuel loading and silvicultural desired conditions, so long as project activities retain functions of the outer Riparian Management Zone, including sediment filtering, large wood recruitment to streams, and protection of the inner Riparian Management Zone from windthrow. Vegetation management in Riparian Management Zones shall not retard attainment of aquatic and riparian desired conditions.	**MON-RMZ-03** What vegetation management activities have occurred in riparian management zones? *(i)(ii)(iv)(vii)	**Vegetation management in RMZs** • *Number of decisions that include vegetation management treatments within RMZs* • *Number of decisions with vegetation management activities located within RMZs that incorporated Multiscale Analysis and the Stream Conditions Indicator Assessment* • *Locations, acres, prescriptions, and types of vegetation management actions within RMZs*	WIT INFRA (annual) NEPA decision documents
FW-STD-RMZ-06. Direct ignition of low severity prescribed fire in riparian management zones can achieve or maintain desired conditions so long as: direct ignition within the riparian management zone will not retard attaining water, aquatic, and riparian desired conditions; and direct ignition within the riparian management zone maintains or enhances existing stream conditions and effects to threatened or endangered species and their designated critical habitat are considered.	**MON-RMZ-04** Has direct ignition in RMZs maintained or enhanced water, aquatic, and riparian desired conditions? **MON-RMZ-05** Have aquatic desired conditions been retarded? *(i)(ii)(iv)(vii)	**Prescribed Fire in RMZs** • *Number of prescribed fire projects with direct ignition in the RMZ that incorporated best management practices and utilized Potential Management Approaches for direct ignition of prescribed fire in RMZs.* • *Percent of projects that maintained or enhanced water, aquatic, and riparian desired conditions* • *Percent of prescribed fire area within RMZ resulting in low severity burn effects[1]* • *Percent of projects that have created conditions with a reduced functioning level as measured utilizing the stream condition indicator assessment*	WIT INFRA FACTS NEPA decision documents Project monitoring report (annual)

[1]See Burn Severity definitions in the glossary and utilize descriptions found in the Field guide for mapping post-fire soil burn severity RMRS-GTR-243 (Parsons et al. 2010).

Infrastructure (INF and ARINF)

*2012 Planning Rule required questions element 1-8 [36 CFR 219.12(a)(5)] or (FSH 1909.12 Section 32.13f)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
FW-DC-ARINF-01. The transportation system has minimal impacts on aquatic and riparian conditions through reduced hydrologic connectivity of roads to streams, lower sediment delivery to streams, reduced road impact to floodplains, and improved aquatic organism passage, where transportation infrastructure affects these features. **FW-STD-ARINF-07.** In the Conservation Watershed Network and HUC12 subwatersheds with Endangered Species Act critical habitat or listed aquatic species, when constructing or reconstructing roads, projects shall result in a net decrease in the hydrologic connectivity of the road system and stream channel network. Treatment priority shall be given to roads or road segments that pose the greatest relative ecological risk to riparian and aquatic ecosystems. The net decrease is measured by project area. **FW-OBJ-INF-01.** Complete 600 miles of road work, such as reconstruction; re-routing; road improvements; decommissioning; or placing roads in intermittent stored service, every 5 years. Priorities shall include reducing effects on desired aquatic and riparian conditions from chronic sediment delivery or potential future road prism failures, including previously decommissioned roads where drainage features have failed.**FW-OBJ-INF-02.** Annually maintain 1,400 miles of operational maintenance level 2 through 5 roads.	**MON-INF-02** What is the status of road improvement and maintenance across the Nez Perce-Clearwater? *(i)(ii)(iv)(vi)(vii)	**System Road Improvement and Maintenance** • *Miles, location, and types of road reconstruction or road improvements* • *Miles of operational maintenance level 2-5 road maintained* • *Number of culverts removed or upgraded* • *Amount of net decrease in hydrologic connectivity of the road system by project area in CWN watersheds and HUC12 subwatersheds with Endangered Species Act critical habitat or listed aquatic species, if road construction or reconstruction actions have been implemented* **Climate Change Adaptation** • *Number and type of climate change adaptation strategies incorporated into project development*	INFRA Project records

Aquatic and Riparian Livestock Grazing (ARGRZ)

*2012 Planning Rule required questions element 1-8 [36 CFR 219.12(a)(5)] or (FSH 1909.12 Section 32.13f)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
FW-STD-ARGRZ-02. Where livestock trailing, bedding, watering, salting, loading, off road vehicle use for managing or gathering livestock, and other related activities in riparian management zones are adversely affecting aquatic resources, annual operating	**MON-ARGRZ-01** Are measures incorporated into annual operating instructions to reduce	**Annual Operating Instructions** • *Number of active annual operating instructions for livestock grazing*	Forest records NRM

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
instructions shall include measures to mitigate or relocate to other areas or times. **FW-STD-ARGRZ-03.** During livestock grazing authorizations, reauthorizations, or updates to annual operating instructions, include measures to prevent trampling of fish redds of federally listed fish species and species of conservation concern.	impacts to aquatic resources? *(i)(ii)(iv)	*permits that included measures to reduce impacts to aquatic resources* • *Number and types of measures incorporated into annual operating instructions to reduce impacts to aquatic resources* • *Number of active livestock grazing allotments containing streams with Endangered Species Act or SCC fish species* • *Number of active annual operating instructions for livestock grazing permits for allotments containing streams with Endangered Species Act or SCC fish species that included measures to prevent trampling of Endangered Species Act and SCC fish redds* • *Number and types of measures incorporated into annual operating instructions to prevent trampling of Endangered Species Act and SCC fish redds*	
FW-STD-ARGRZ-01. Livestock grazing shall be authorized or reauthorized only when measures are included in the authorization to avoid or mitigate adverse effects to fish and riparian habitat that may result from grazing practices. Where livestock grazing is found to prevent or retard attainment of aquatic and riparian desired conditions, grazing practices shall be modified by practices such as adjusting accessibility of riparian areas to livestock, length of grazing season, stocking levels, or timing of grazing. **FW-GDL-ARGRZ-01.** Livestock grazing shall be authorized or reauthorized only when measures are included in the authorization to avoid or mitigate adverse effects to fish and riparian habitat that may result from grazing practices. Where livestock grazing is found to prevent or retard attainment of aquatic and riparian desired conditions, grazing practices shall be modified by practices such as adjusting accessibility of riparian areas to livestock, length of grazing season, stocking levels, or timing of grazing.	**MON-ARGRZ-02** What is the status and trend of aquatic and riparian conditions in active livestock grazing allotments? *(i)(ii)(iv)	**Aquatic and Riparian Condition** • *Total number of active livestock grazing allotments containing low gradient (<3%) streams* • *Average end of season stubble height (cm/inches) along the greenline for each allotment containing low gradient streams* • *Number of active allotments that did and did not meet end of season stubble height (cm/inches) requirements along the greenline for each allotment containing low gradient streams* • *Number and type of grazing practice modifications incorporated into*	Forest monitoring data – field collection Forest records NRM PIBO

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
		reauthorizations and new authorizations • *PIBO (stream bank angle, riparian vegetation, width to depth ratio)*	

Aquatic and Riparian Recreation (ARREC)

*2012 Planning Rule required questions element 1-8 [36 CFR 219.12(a)(5)] or (FSH 1909.12 Section 32.13f)

Selected Plan Components	Monitoring Question	Indicator(s) Measure(s)	Data Source/Storage (Interval of Data Collection)
FW-DC-ARREC-01. Recreation facilities and their use, including trails and dispersed sites, have minimal impacts on aquatic resources, including threatened and endangered species, designated critical habitat, and aquatic species of conservation concern. **FW-OBJ-REC-01**. Annually maintain to standard a minimum of 30 percent of National Forest System trail miles. **FW-OBJ-REC-02.** Reduce deferred maintenance of trails by five percent, every five years.	**MON-ARREC-01** What is the status of trail improvement and maintenance influencing aquatic resources? *(i)(ii)(iv)(vii)	**System Trail Improvement and Maintenance** • *Number of trail culverts or fords removed or upgraded* • *Miles of trail maintained to standard* • *Percent reduction in deferred maintenance of trails*	INFRA

Appendix E. Crosswalk of Standards and Guidelines Between PACFISH/INFISH and the Land Management Plan Aquatic Ecosystem Plan Components

A crosswalk of standards and guidelines between PACFISH/INFISH and the Nez Perce-Clearwater Land Management Plan's ecosystem plan components are included in the tables of the appendix (Table 150, Table 151, Table 152, Table 153, Table 154, Table 155, Table 156, Table 157, and Table 158).

Table 150. Crosswalk between PACFISH/INFISH standards, and the Land Management Plan standards and guidelines for timber harvest

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
TM-1 PACFISH: Do not include RHCAs in the land base used to determine the Allowable Sale Quantity, but any volume harvested can contribute to the timber sale program. **TM-1:** Prohibit timber harvest, including fuelwood cutting, in Riparian Habitat Conservation Areas, except as described below. **a.** Where events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting only where present and future woody debris needs are met, where cutting would not retard or prevent attainment of other Riparian Management Objectives, and where adverse effects on inland native and listed anadromous fish can be avoided. For watersheds with listed salmon or designated critical habitat or priority watersheds, complete Watershed Analysis prior to salvage cutting in Riparian Habitat Conservation Areas. b. Apply silvicultural practices for Riparian Habitat Conservation Areas to acquire desired vegetation characteristics where needed to attain Riparian Management Objectives. Apply silvicultural practices in a manner that does not retard attainment of Riparian Management Objectives and that avoids adverse effects on listed anadromous and inland native fish.	**FW-STD-RMZ-01.** Vegetation management shall only occur, in riparian management zones from the edges of the active stream channel to within 150 feet within Riparian Management Zone Category 1 and to the edges of the active stream channel to 100 feet within Riparian Management Zone Category 2, 3, and 4, in order to restore or enhance aquatic and riparian-associated resources. Non-mechanical treatments, e.g., hand fuel treatments, prescribed fire, small diameter (e.g., sapling, pole) conifer thinning, may be authorized as long as aquatic and riparian-associated resources are maintained. Timber Harvest in this zone shall leave trees on site or use for aquatic restoration. Vegetation management may occur in the outer Riparian Management Zones to meet desired conditions for fuel loading and silvicultural desired conditions, so long as project activities retain functions of the outer Riparian Management Zone including sediment filtering, large wood recruitment to streams, and protection of the inner Riparian Management Zone from windthrow. Vegetation management in Riparian Management Zones shall not retard attainment of aquatic and riparian desired conditions. **FW-STD-RMZ-04.** Fuelwood cutting shall not be authorized within 150 feet of the stream edge. **FW-STD-RMZ-07.** The RMZ definitions in the introduction of section 2.2.2 (Riparian Management Zones) shall be used for all actions and projects. **FW-GDL-RMZ-01.** New landings, skidding, staging or decking, and machine burn piling should be located outside RMZs to minimize effects to riparian and aquatic resources. Where new activities inherently must occur in RMZs, locate them so that they do not degrade or retard aquatic and riparian desired conditions. **FW-GDL-RMZ-02.** To reduce the likelihood of sediment input to streams, avoid new road, trail, and landing construction, including temporary roads,

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
	in RMZs except where: a) necessary for stream crossings, or b) a road or trail relocation contributes to attainment of aquatic and riparian desired conditions, or c) Forest Service authorities are limited by law or regulation (e.g., General Mining Law of 1872). Temporary roads should be managed to protect aquatic and riparian desired conditions. **FW-GDL-RMZ-03.** To prevent damage to stream channels, yarding activities should achieve full suspension over the active channel. **FW-GDL-ARINF-01.** Construction, reconstruction, and maintenance activities of roads, skid trails, temporary roads, and airstrips, should hydrologically disconnect the drainage system from delivering water, sediment, and pollutants to water bodies, to prevent concentrated water from directly entering streams. **FW-GDL-ARINF-03.** To reduce the risk of sediment delivery from gully formation or mass wasting when closing travel routes such as roads, skid trails, and temporary roads with physical barriers (e.g., berms), drainage features should be left in a condition that will function without any maintenance for the planned duration of the closure.**FW-GDL-ARINF-04.** To reduce road-related mass wasting and sediment delivery to watercourses, new and relocated roads, including skid trails and temporary roads, and other linear features should not be constructed on lands with high mass wasting potential.
RA-2. Trees may be felled in Riparian Habitat Conservation Areas when they pose a safety risk. Keep felled trees on site when needed to meet woody debris objectives.	**FW-STD-RMZ-05.** Trees felled for safety shall be retained onsite unless in excess of what is needed to achieve aquatic and riparian desired conditions. Trees shall be directionally felled towards or into streams, where it is safe and practical to do so. Trees felled within developed recreation sites or administration sites may be moved but must still remain within the RMZ. If aquatic and riparian desired conditions for wood are met at the site, surplus wood can be transported to other aquatic and riparian restoration project sites. Exceptions to this standard are allowed in developed recreation and administrative sites where needed to address concerns for human safety or infrastructure and when not practicable to leave on site.

Table 151. Crosswalk between PACFISH/INFISH standards, and the Land Management Plan standards and guidelines for fuels

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
FM-1. Design fuel treatment and fire suppression strategies, practices, and actions so as not to prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could perpetuate or be damaging to long-term ecosystem function, listed anadromous, or designated critical habitat, and inland native fish.	**FW-STD-RMZ-01.** Vegetation management shall only occur, in riparian management zones from the edges of the active stream channel to within 150 feet within Riparian Management Zone Category 1 and to the edges of the active stream channel to 100 feet within Riparian Management Zone Category 2, 3, and 4, in order to restore or enhance aquatic and riparian-associated resources. Non-mechanical treatments, e.g., hand fuel treatments, prescribed fire, small diameter (e.g., sapling, pole) conifer thinning, may be authorized as long as aquatic and riparian-associated resources are maintained. Timber Harvest in this zone shall leave trees on site or use for aquatic restoration. Vegetation management may occur in the outer Riparian Management Zones to meet desired conditions for fuel loading and silvicultural desired conditions, so long as project activities retain functions of the outer Riparian Management Zone including sediment filtering, large wood recruitment to streams, and protection of the inner Riparian Management Zone from windthrow. Vegetation management in Riparian Management Zones shall not retard attainment of aquatic and riparian desired conditions. **FW-STD-RMZ-06.** Direct ignition of low severity prescribed fire in RMZ is allowed to achieve or maintain desired conditions so long as: direct ignition within the RMZ will not retard attaining water, aquatic and riparian desired conditions; direct ignition within the RMZ maintains or enhances existing stream conditions, and effects to threatened or endangered species and their designated critical habitat are considered.
FM-2. Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of Riparian Habitat Conservation Areas. If the only suitable location for such activities is within the Riparian Habitat Conservation Area, an exemption may be granted following a review and recommendation by a resource advisor. The advisor would prescribe the location, use conditions, and rehabilitation requirements, with avoidance of adverse effects to inland native fish a primary goal. Use an interdisciplinary team, including a fishery biologist, to predetermine incident base and helibase locations during presuppression planning.	**FW-GDL-RMZ-05.** To minimize adverse effects to Endangered Species Act listed species, riparian areas, aquatic habitat, and riparian dependent species, new incident bases, camps, helibases, helispots, staging areas, and other centers for incident activities should be located outside of riparian management zones. When no practical alternative exists, measures to maintain, restore, and enhance riparian areas, stream habitat, and riparian dependent species should be used.
FM-3. Avoid delivery of chemical retardant, foam, or additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or, following a review and recommendation by a resource advisor and a fishery biologist, when the action agency determines an escape fire would cause more long-term damage to fish habitats than chemical delivery to surface waters.	**FW-GDL-RMZ-04.** Aerial application of chemical retardant, foam, or other fire chemicals and petroleum should be avoided in mapped aerial retardant avoidance areas in order to minimize impacts to the riparian management zones and aquatic resources.

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
FM-4. Design prescribed burn projects and prescriptions to contribute to the attainment of the Riparian Management Objectives.	**FW-GDL-WTR-06.** Firelines should be located and configured to minimize sedimentation to waterbodies, limit capture of overland and stream flows, and restrict development of unauthorized roads and trails. Firelines should be restored following suppression or prescribed fire activities. **FW-GDL-RMZ-06.** To minimize sediment delivery and adverse effects to stream channels, construction of machine fireline in riparian management zones should be avoided, except where needed to cross streams.
FM-5. Immediately establish an emergency team to develop a rehabilitation plan to attain riparian management objectives and avoid adverse effects on listed anadromous fish and inland native fish whenever Riparian Habitat Conservation Areas are significantly damaged by a wildfire or a prescribed fire burning out of prescription.	**FW-GDL-RMZ-07.** To reduce sediment delivery to streams during or after fire suppression activities, disturbed areas in riparian management zones, such as firelines, drop-points, camps, roads, and trails, should be restored by actions such as scattering slash piles, replacing logs and boulders, scarifying soils, re-contouring terrain, and reseeding with native species.

Table 152. Crosswalk between PACFISH/INFISH standards, and the Land Management Plan standards and guidelines for roads

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
RF-2. For each existing or planned road, meet the Riparian Management Objectives and avoid adverse effects on listed anadromous fish and inland native fish by: **b.** minimizing road and landing locations in Riparian Habitat Conservation Areas,	**FW-GDL-RMZ-02.** To reduce the likelihood of sediment input to streams, avoid new road, trail, and landing construction, including temporary roads, in riparian management zones except where: a. necessary for stream crossings, or b. a road or trail relocation contributes to attainment of aquatic and riparian desired conditions, or c. Forest Service authorities are limited by law or regulation (e.g., General Mining Act of 1872). Temporary roads should be managed to protect aquatic and riparian desired conditions. **FW-GDL-ARINF-04.** To reduce road-related mass wasting and sediment delivery to watercourses, new and relocated roads, including skid trails and temporary roads, and other linear features should not be constructed on lands with high mass wasting potential. **FW-GDL-ARINF-08.** To avoid adverse effects to water resources, wetlands and seasonally wet meadows should be avoided when constructing new roads and landings, including temporary roads. For all roads, and where reconstruction of existing roads cannot avoid water courses and wetlands drainage features should maintain wetland functions and characteristics. **FW-GDL-ARINF-09.** When constructing, reconstructing, or maintaining roads, including temporary roads, road drainage should be routed away from potentially unstable channels, fills, and hillslopes, to prevent destabilization of channels and hillslopes.

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
RF-2. For each existing or planned road, meet the Riparian Management Objectives and avoid adverse effects on listed anadromous fish and inland native fish by: avoiding sediment delivery to streams from the road surface, 1. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe. 2. Route road drainage away from potentially unstable stream channels, fills, and hillslopes.	**FW-STD-ARINF-02.** Best management practices shall be used during dust abatement applications on roads, and ensure chemicals are not applied directly to watercourses; water bodies such as ponds and lakes; or wetlands. **FW-GDL-ARINF-02.** To reduce the risk to aquatic resources when decommissioning roads, making roads impassable, or closing roads for longer than one year, roads should be left in a hydrologically stable condition where road drainage is routed away from water resources and landslide prone areas and towards stable areas of the forest floor to provide filtering and infiltration. **FW-GDL-ARINF-03.** To reduce the risk of sediment delivery from gully formation or mass wasting when closing travel routes such as roads, skid trails, and temporary roads with physical barriers (e.g. berms), drainage features should be left in a condition that will function without any maintenance for the planned duration of the closure.
RF-2. For each existing or planned road, meet the Riparian Management Objectives and avoid adverse effects on listed anadromous fish and inland native fish by: **e.** avoiding disruption of natural hydrologic flow paths.	**FW-GDL-ARINF-01.** Construction, reconstruction, and maintenance activities of roads, skid trails, temporary roads, and airstrips, should hydrologically disconnect the drainage system from delivering water, sediment, and pollutants to water bodies to prevent concentrated water from directly entering streams. **FW-GDL-ARINF-10.** Transportation infrastructure should be designed to maintain natural hydrologic flow paths, including interception of surface and subsurface flow, to the extent practical. For example, streams and seeps upslope from roads should have cross-drains or relief culverts with sufficient capacity to ensure water is not routed down ditches.
RF-2. For each existing or planned road, meet the Riparian Management Objectives and avoid adverse effects on listed anadromous fish and inland native fish by: **f.** avoiding sidecasting of soils or snow on road segments within or abutting Riparian Habitat Conservation Areas in key or priority watersheds.	**FW-STD-ARINF-03.** To reduce or prevent sediment delivery to water, on roads other than outsloped roads, road surface and fill materials shall not be sidecast into streams during road construction or reconstruction, when occurring within or adjacent to riparian management zones. **FW-GDL-ARINF-07.** To reduce sediment delivery from maintenance activities, such as road blading and snow plowing, avoid sidecasting into streams. Care should be taken when plowing snow so as not to include road soil. Breaks should be incorporated in the snow berms to direct water off the plowed surface.
RF-3 Determine the influence of each road on the Riparian Management Objectives. Meet Riparian Management Objectives and avoid adverse effects on listed anadromous and inland native fish by: reconstructing road and drainage features that do not meet design criteria or operation and maintenance standards, or that have been shown to be less effective than designed for controlling sediment delivery, or that retard	**FW-STD-ARINF-05.** When constructing or reconstructing roads, incorporating woody debris into the fill portion of the road prism shall be avoided. **FW-GDL-ARINF-02.** To reduce the risk to aquatic resources when decommissioning roads, making roads impassable, or closing roads for longer than one year, roads should be left in a hydrologically stable condition where road drainage is routed away from water resources and

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
attainment of Riparian Management Objectives, or do not protect priority watersheds from increased sedimentation. c. closing and stabilizing or obliterating, and stabilizing roads not needed for future management activities. Prioritize these actions based on the current and potential damage to listed anadromous and inland native fish in key and priority watersheds, and the ecological value of the riparian resources affected.	landslide prone areas and towards stable areas of the forest floor to provide filtering and infiltration. **FW-GDL-ARINF-06.** To maintain channel stability and reduce sediment delivery to watercourses, when reconstructing roads, fords should be hardened to protect the stream bed, banks, and approaches.
RF-3 Determine the influence of each road on the Riparian Management Objectives. Meet Riparian Management Objectives and avoid adverse effects on listed anadromous and inland native fish by: b. prioritizing reconstruction based on the current and potential damage to listed anadromous fish and their designated critical habitat and inland native fish and their priority watersheds, the ecological value of the riparian resources affected, and the feasibility of options such as helicopter logging and road relocation out of Riparian Habitat Conservation Areas.	**FW-STD-ARINF-07.** In the Conservation Watershed Network and HUC12 subwatersheds with Endangered Species Act critical habitat or listed aquatic species, when constructing or reconstructing roads, projects shall result in a net decrease in the hydrologic connectivity of the road system and stream channel network unless no further decreases are needed to meet desired conditions for Water and Aquatic Resources or Conservation Watershed Network. Treatment priority shall be given to roads or road segments that pose the greatest relative ecological risk to riparian and aquatic ecosystems. The net decrease is measured by project area.
RF-4. Construct new, and improve existing, culverts, bridges, and other stream crossings to accommodate a 100-year flood, including associated bedload and debris, where those improvements would/do pose a substantial risk to riparian conditions. Substantial risk improvements include those that do not meet design and operation maintenance criteria, or that have been shown to be less effective than designed for controlling erosion, or that retard attainment of Riparian Management Objectives, or that do not protect designated critical habitat and priority watersheds from increased sedimentation. Base priority for upgrading on risks in key and priority watersheds and the ecological value of the riparian resources affected. Construct and maintain crossings to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.	**FW-STD-ARINF-04.** New, replacement, and reconstructed stream crossing sites such as culverts, bridges and other stream crossings shall accommodate at least the 100-year flow, including associated bedload and debris. **FW-GDL-ARINF-05.** To maintain free-flowing streams, new, replacement, and reconstructed stream crossing sites, such as culverts, bridges and other stream crossings, should be constructed to prevent diversion of stream flow out of the channels and down the road in the event the crossing is plugged or has a flow greater than the crossing was designed.
RF-5. Provide and maintain fish passage at all relevant road crossings of existing and potential fish-bearing streams.	**FW-GDL-ARINF-11.** Culverts and bridges in fish-bearing and perennial streams should allow for passage of fish and other aquatic and riparian dependent species through the establishment of banks inside or beneath the crossing structure and mimicking the natural channel features, unless precluded by site characteristics such as bedrock or high channel gradient. **FW-STD-ARINF-06.** In fish bearing streams, construction, reconstruction, or replacement of stream crossings shall not impair passage of any life stages of native aquatic organisms, unless barriers are desired to maintain or prevent spread or invasion of non-native species in alignment with fish management agencies.

Table 153. Crosswalk between PACFISH/INFISH standards, and the Land Management Plan standards and guidelines for minerals

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
MM-1. Avoid adverse effects to listed species and designated critical habitat from mineral operations. Minimize adverse effects to inland native fish species from mineral operations.	**FW-STD-AREM-03.** Mineral activities on National Forest System lands shall avoid or minimize adverse effects to aquatic threatened or endangered species and populations or their designated critical habitat.
MM-1 (PACFISH). If a Notice of Intent indicates that a mineral operation would be located in a Riparian Habitat Conservation Area, or could affect attainment of Riparian Management Objectives, or adversely affect listed anadromous fish, require a reclamation plan approved Plan of Operations (or other such governing document), and reclamation bond. For effects that cannot be avoided, such plans and bonds must address the costs of removing facilities, equipment, and materials; recontouring disturbed areas to near pre-mining topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvage and replacement of topsoil; and seedbed preparation and revegetation to attain Riparian Management Objectives and avoid adverse effects on listed anadromous fish. Ensure Reclamation Plans contain measurable attainment and bod release criteria for each reclamation activity. MM-1 (INFISH). If a Notice of Intent indicates that a mineral operation would be located in a Riparian Habitat Conservation Area, consider the effects of the activity on inland native fish in the determination of significant surface disturbance pursuant to 36 CFR 228.4. For operations in a Riparian Habitat Conservation Area ensure operators take all practicable measures to maintain, protect, and rehabilitate fish and wildlife habitat which may be affected by the operations. When bonding is required, consider (in the estimation of bond amount) the cost of stabilizing, rehabilitating, and reclaiming the area of operations.	**FW-GDL-AREM-04.** Mineral operations should minimize adverse effects to aquatic and riparian- dependent resources in riparian management zones. Best management practices and other appropriate conservation measures should be included in plans of operations to mitigate potential mine operation effects.
MM-2. Locate structures, support facilities, and roads outside Riparian Habitat Conservation Areas. Where no alternative to siting facilities in Riparian Habitat Conservation Areas exists, locate, and construct the facilities in ways that avoid impacts to Riparian Habitat Conservation Areas and streams and adverse effects on inland native fish. Where no alternative to road construction exists, keep roads to the minimum necessary for the approved mineral activity. Close, obliterate and revegetate roads no longer required for mineral or land management activities.	**FW-GDL-AREM-01.** To prevent adverse effects to streams, wetlands, and other riparian dependent resources, all proposed mineral operations should avoid riparian management zone. If the riparian management zone cannot be avoided, plan of operations should include practicable measures to maintain, protect, and rehabilitate water quality and habitat for fish and wildlife and other riparian-dependent resources affected by the operations. Operations should not retard or prevent attainment of aquatic and riparian desired conditions. Exceptions to this guideline include situations where Forest Service has limited discretional authorities. In those cases, project effects should not prevent or retard attaining aquatic and riparian desired conditions to the extent possible within those authorities. **FW-STD-AREM-01.** Plans of Operation that propose activities in riparian management zones shall include a reclamation plan and a reclamation bond that address the cost of removing facilities, equipment, and materials; re-contouring disturbed areas to pre-mining topography; isolating and neutralizing or removing toxic materials; salvaging or

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
	replacing topsoil; and revegetating with trees and shrubs or native plant seed to move toward attainment of aquatic and riparian desired conditions and avoid adverse effects on native fish. **FW-GDL-AREM-02.** Mineral operations should reuse existing access routes and processing sites left from previous entries as long as they are not causing unacceptable impacts to aquatic and riparian dependent resources. Where new construction or relocation is necessary, to the maximum extent possible, construct and locate new structures, support facilities, and roads outside of riparian management zones. If new structures, support facilities and roads cannot be constructed outside riparian management zones because of site limitations, then construct and manage them to minimize adverse effects to aquatic and riparian dependent resources. When no longer required for mineral activities, structures and support facilities should be removed, and roads should be decommissioned or placed into intermittent stored service to achieve aquatic and riparian desired conditions.
MM-3. Prohibit solid and sanitary waste facilities in Riparian Habitat Conservation Areas.	**FW-STD-AREM-02.** Mine waste with the potential to generate hazardous material as defined by the Comprehensive Environmental Response, Compensation, and Liability Act shall not be authorized within riparian management zones where groundwater contamination is possible. The exception is temporary staging of waste during abandoned mine cleanup. **FW-GDL-ARREC-01.** To protect aquatic and riparian resources, new and reconstructed solid and sanitary waste facilities should not be located within 100 feet of water, unless no other alternative exists.
MM-4. For leasable minerals, prohibit surface occupancy within Riparian Habitat Conservation Areas for oil, gas, and geothermal exploration and development activities where contracts and leases do not already exist, unless there are no other options for location and Riparian Management Objectives can be attained and adverse effects to listed anadromous fish and inland native fish can be avoided. Adjust the operating plans of existing contracts to (1) eliminate impacts that prevent attainment of Riparian Management Objectives and (2) avoid adverse effects to listed anadromous and inland native fish. **MM-6**. Develop inspection, monitoring, and reporting requirements for mineral activities. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases, or permits as needed to eliminate impacts that prevent attainment of Riparian Management Objectives and avoid adverse effects on listed anadromous and inland native fish.	**FW-GDL-AREM-03.** To maintain water quality and to prevent biological, chemical, or industrial pollutants from being delivered to water bodies, mineral exploration, processing, and extraction projects should not have direct water flow paths to streams, lakes, or wetlands. Projects should install barriers between streams, lakes, wetlands, or groundwater dependent ecosystems and construction-related pollutant hazards such as sumps, processing pits, fuel storage, latrines, adits and shafts, underground workings, open pits, overburden, development rock and waste rock dumps, tailings impoundments, leach pads, mills, and process water ponds or natural pollutant hazards such as acidity, metals, sulfate, cyanide, or nitrate or a combination of the preceding.
MM-5: Permit sand and gravel mining and extraction within Riparian Habitat Conservation Areas only if no alternatives exist, if the action(s) would not	**FW-GDL-RMZ-09.** New saleable sand and gravel mining and extraction should not occur within riparian management zones, to minimize ground

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
retard or prevent attainment of Riparian Management Objectives, and adverse effects to listed anadromous and inland native fish can be avoided.	disturbance and sediment inputs, and avoid adverse effects to riparian vegetation and water temperature.

Table 154. Crosswalk between PACFISH/INFISH standards, and the Land Management Plan standards and guidelines for grazing

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
GM-1. Modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are **Likely to Adversely Affect** listed anadromous fish or inland native fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objectives and avoiding adverse effects on listed anadromous fish. **GM-2.** Locate new livestock handling and/or management facilities outside of Riparian Habitat Conservation Areas. For existing livestock handling facilities inside the Riparian Habitat Conservation Areas, assure that facilities do not prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be met. **GM-3** Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that would not retard or prevent attainment of Riparian Management Objectives or adversely affect listed anadromous or inland native fish. **GM-4.** Adjust wild horse and burro management to avoid impacts that prevent attainment of Riparian Management Objectives or adversely affect listed anadromous or inland native fish.	**FW-STD-ARGRZ-01.** Livestock grazing shall be authorized or reauthorized only when measures are included in the authorization to avoid or mitigate adverse effects to fish and riparian habitat that may result from grazing practices. Where livestock grazing is found to prevent or retard attainment of aquatic and riparian desired conditions, grazing practices shall be modified by practices such as adjusting accessibility of riparian areas to livestock, length of grazing season, stocking levels, or timing of grazing. **FW-STD-ARGRZ-02.** Where livestock trailing, bedding, watering, salting, loading, off road vehicle use for managing or gathering livestock, and other related activities in riparian management zones are adversely affecting aquatic resources, annual operating instructions shall include measures to mitigate or relocate to other areas or times. **FW-STD-ARGRZ-03.** During livestock grazing authorizations, reauthorizations, or updates to annual operating instructions, include measures to prevent trampling of fish redds of federally listed fish species and species of conservation concern. **FW-GDL-ARGRZ-01.** Livestock grazing shall be authorized or reauthorized only when measures are included in the authorization to avoid or mitigate adverse effects to fish and riparian habitat that may result from grazing practices. Where livestock grazing is found to prevent or retard attainment of aquatic and riparian desired conditions, grazing practices shall be modified by practices such as adjusting accessibility of riparian areas to livestock, length of grazing season, stocking levels, or timing of grazing. **FW-GDL-ARGRZ-02.** To maintain water quality and minimize the sediment that is generated and delivered to watercourses from active livestock trailing, livestock trail stream crossings and approaches should be hardened or relocated, where needed, to achieve aquatic desired conditions. **FW-GDL-ARGRZ-03.** To maintain quality and quantity of water flows to, within, or between groundwater dependent ecosystems, water to new or reconstructed spring developments should be protected from livestock trampling.

Table 155. Crosswalk between PACFISH/INFISH standards, and the Land Management Plan standards and guidelines for recreation

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
RM-1. Design, construct, and operate recreation facilities, including trails and dispersed sites, in a manner that does not retard or prevent attainment of the Riparian Management Objectives and avoids adverse effects on listed anadromous and inland native fish. Complete watershed analysis prior to construction of new recreation facilities in Riparian Habitat Conservation Areas within key and priority watersheds. For existing recreation facilities inside Riparian Habitat Conservation Areas, assure that the facilities or use of the facilities would not prevent attainment of Riparian Management Objectives or adversely affect listed anadromous and inland native fish. Relocate or close recreation facilities where Riparian Management Objectives cannot be met or adverse effects on listed anadromous and inland native fish cannot be avoided. **RM-2.** Adjust dispersed and developed recreation practices that retard or prevent attainment of Riparian Management Objectives or adversely affect listed anadromous and Inland native fish. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective in meeting Riparian Management Objectives and avoiding adverse effects on listed anadromous and inland native fish, eliminate the practice or occupancy. **RM-3.** Address attainment of Riparian Management Objectives and potential effect on listed anadromous and inland native fish in Wild and Scenic Rivers, Wilderness, and other Recreation Management plans.	**FW-GDL-WTR-05**. To maintain quality and quantity of water flows to, within, or between groundwater dependent ecosystems, new or reconstructed groundwater use developments such as recreation and administrative sites, drinking water wells, or wastewater facilities should not: • Be developed in riparian management zones (unless no alternatives exist); • Measurably lower river flows, lake levels, or flows to wetlands or springs; or • Discharge pollutants directly to surface water or groundwater unless covered by a National Pollutant Discharge Elimination System permit. **FW-GDL-ARREC-01.** To protect aquatic and riparian resources, new and reconstructed solid and sanitary waste facilities should not be located within 100 feet of water, unless no other alternative exists. **FW-GDL-ARREC-02.** To reduce potential adverse effects to water quality and aquatic resources, construction of new facilities or infrastructure within floodplains should be avoided. Where new activities inherently must occur in riparian management zones (e.g., at road and trail stream crossings, boat ramps, or docks), they should be located and designed to minimize adverse effects to floodplains and other riparian-dependent resource conditions (e.g., within geologically stable areas and avoiding major spawning areas). **FW-GDL-ARREC-03.** To reduce the risk of sediment delivery when closing trails with physical barriers (e.g. berms) for longer than one season, drainage features should be left in a condition that will function without any maintenance for the planned duration of the closure. **FW-GDL-ARREC-04.** To reduce trail-related mass wasting and sediment delivery to watercourses, new and relocated trails should not be constructed on lands with high mass wasting potential. **FW-GDL-ARREC-05.** Trail construction, reconstruction, and maintenance activities should prevent concentrated water from directly entering streams, by hydrologically disconnected the trails from delivering water, sediment, and pollutants to water bodies. **FW-GDL-ARREC-06**. To maintain channel stability and reduce sediment delivery to watercourses, when constructing or reconstructing trails, fords should be hardened to protect the stream bed, banks, and approaches.

Table 156. Crosswalk between PACFISH/INFISH standards, and the Land Management Plan standards and guidelines for riparian and channel management

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
RA-3. Apply herbicides, pesticides, and other toxicants, and other chemicals in a manner that does not retard or prevent attainment of Riparian Management Objectives and avoids adverse effects on listed anadromous and inland native fish. **RA-5.** Locate water drafting sites to avoid adverse effects to inland native fish and instream flows, and in a manner that does not retard or prevent attainment of Riparian Management Objectives.	**FW-STD-WTR-03.** Portable pump set-ups and fuel containers in riparian management zones shall include appropriate containment and cleanup provisions for fuel spills. **FW-STD-WTR-05**. When drafting water, pumps shall be screened to prevent capture or harm of fish and aquatic organisms. Pumping sites shall be located away from spawning gravels. To prevent the spread of invasive species, pumps, charged hoses, and drafted water shall not be backflushed or discharged into stream channels, wetlands, or other water bodies. **FW-GDL-WTR-03**. Water drafting sites should be located and managed to minimize adverse effects on stream channel stability, sedimentation, and instream flows needed to maintain riparian resources, channel conditions, and fish habitat. **FW-STD-RMZ-07.** The RMZ definitions in the introduction of section 2.2.2 (Riparian Management Zones) shall be used for all actions and projects. **FW-GDL-RMZ-08**. To maintain water quality, pumping directly from a stream channel should be avoided if chemical products are to be directly mixed with water being withdrawn. When chemicals are used, pumping should be conducted from a fold-a-tank that is located outside the riparian management zones. **FW-STD-RMZ-03.** Herbicides, pesticides, and other toxicants and chemicals shall only be applied within riparian management zones when the activity does not retard attainment of aquatic and riparian desired conditions.
RA-4. Prohibit storage of fuels and other toxicants within Riparian Habitat Conservation Areas. Prohibit refueling within Riparian Habitat Conservation Areas unless there are no other alternatives. Refueling sites within a Riparian Habitat Conservation Area must be approved by the Forest Service or Bureau of Land Management and have an approved spill containment plan.	**FW-STD-RMZ-02**. Staging of vehicles or heavy equipment, refueling, and fuel storage shall be located outside of riparian management zones to avoid water contamination. If no other location is appropriate and refueling or storage is needed within riparian management zones, locations must be approved by the Timber Contracting Officer, Contracting Officer, or their designee and have an approved spill containment plan.
	FW-GDL-WTR-01. To maintain channel forming processes and aquatic habitat, large woody debris should not be cut or removed from stream channels or floodplains unless it threatens public safety or critical infrastructure, such as mid-channel bridge piers. **FW-GDL-WTR-04.** To avoid adverse effects to spawning and staging fish, their eggs, and embryos, instream activities, and near-stream activities with the potential to disturb spawning fish and directly deliver

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
	sediment to spawning habitat, should be implemented in accordance with State of Idaho instream work window guidelines. **FW-GDL-WTR-07.** To conserve Pacific lamprey and western pearlshell mussel populations, individuals should be re-located to an alternative site with suitable habitat prior to de-watering channel work proposed in areas containing habitat for these species.

Table 157. Crosswalk between PACFISH/INFISH standards, and the Land Management Plan standards and guidelines for hydroelectric facility leases

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
LH·1. Require instream flows and habitat conditions for hydroelectric and other surface water development proposals that maintain or restore riparian resources, favorable channel conditions, and fish passage, reproduction, and growth. Coordinate this process with the appropriate State agencies. During relicensing of hydroelectric projects, provide written and timely license conditions to the Federal Energy Regulatory Commission (FERC) that require fish passage and flows and habitat conditions that maintain/restore riparian resources and channel integrity. Coordinate relicensing projects with the appropriate State agencies.	**FW-STD-ARLND-01.** When authorizing new lands special uses, or reauthorizing existing uses, include conditions to avoid adverse effects to fish, water, and riparian resources. If adverse effects are unavoidable to Endangered Species Act listed fish, species of conservation concern, impaired water bodies, or stream habitat conditions, authorizations shall require actions that result in the re-establishment, restoration, mitigation, or improvement of conditions and ecological processes to ensure that projects that degrade conditions also include measures to improve conditions to the extent practicable. These processes include in-stream flow regimes, physical and biological connectivity, water quality, and integrity and complexity of riparian and aquatic habitat. **FW-STD-WTR-01.** New stream diversions and associated ditches shall have screens placed on them to prevent capture of fish and other aquatic organisms, using criteria established by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, when listed fish may be present. **FW-STD-ARLND-03.** In the Conservation Watershed Network and subwatersheds with Endangered Species Act critical habitat or listed aquatic species, hydroelectric and other surface water development authorizations shall include requirements for instream flows and habitat conditions that maintain or restore native fish and other desired aquatic species populations, riparian dependent resources, favorable channel conditions, and aquatic connectivity.
LH-3. Issue leases, permits, rights-of-way, and easements to avoid effects that would retard or prevent attainment of the Riparian Management Objectives and avoid adverse effects on listed anadromous and inland native fish. Where the authority to do so was retained, adjust existing leases, permits, rights-of-way, and easements to eliminate effects that would retard or prevent attainment of the Riparian Management Objectives or adversely affect inland native fish. If adjustments are not effective, eliminate the activity. Where the authority to adjust was not retained, negotiate to make changes in existing leases, permits, rights-of-way, and easements to eliminate effects that would prevent attainment of the Riparian Management Objectives or adversely affect inland native fish. Priority for modifying existing leases, permits, rights-of-way, and easements would be based on the current and potential adverse effects on inland native fish and the ecological value of the riparian resources affected.	
LH-2. Locate new hydroelectric ancillary facilities outside Riparian Habitat Conservation Areas. For existing ancillary facilities Inside the RHCA that are essential to proper management, provide recommendations to FERC to assure that the facilities would not prevent attainment of the Riparian Management Objectives and that adverse effects on listed anadromous and inland native fish are avoided. Where these objectives cannot be met, provide recommendations to FERC that such ancillary facilities should be relocated. Locate, operate, and maintain hydroelectric facilities that must be located in	**FW-STD-ARLND-02.** Locate new hydropower support facilities outside of riparian management zones to reduce effects to fish, water, and riparian resources. Support facilities include any facilities or improvements such as workshops, housing, switchyards, staging areas, or transmission lines not directly integral to its operation or necessary for the implementation of prescribed protection, mitigation, or enhancement measures.

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
Riparian Habitat Conservation Areas to avoid effects that would retard or prevent attainment of the Riparian Management Objectives and avoid adverse effects on inland native fish.	**FW-GDL-ARLND-01.** If existing hydropower support facilities are located within the riparian management zones at time of permit reissuance, reduce impacts on aquatic and riparian resources, such as moving support facilities outside of riparian management zones or further from water bodies where feasible. **FW-STD-ARLND-04.** In the Conservation Watershed Network and in subwatersheds with Endangered Species Act critical habitat or listed aquatic species, new hydroelectric facilities and water developments shall not be located in the Conservation Watershed Network unless it can be demonstrated that there are no substantial adverse effects to the fish and water resources used as rationale for the watershed being included in the Conservation Watershed Network. Exceptions to this standard include situations where Forest Service authorities are limited such as the Alaska National Interest Lands Conservation Act, 1872 Mining Law, or valid state water rights. In those cases, project effects shall not retard attainment of desired conditions for watershed function, to the extent possible within Forest Service authorities.

Table 158. Crosswalk between PACFISH/INFISH standards, and the Land Management Plan standards and guidelines for planning, coordination, and project implementation

PACFISH/INFISH Standards	Land Management Plan Standards and Guidelines
WR-1. Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to attainment of riparian management objectives. **WR-3 PACFISH ONLY**: Do not use planned restoration as a substitute for preventing habitat degradation (i.e., use planned restoration only to mitigate existing problems, not to mitigate the effects of proposed activities). **FW-1.** Design and implement fish and wildlife habitat restoration and enhancement actions in a manner that contributes to attainment of the Riparian Management Objectives. **WR-2.** Cooperate with Federal, State, local, and Tribal agencies, and private landowners to develop watershed-based Coordinated Resource Management Plans (CRMPs) or other cooperative agreements to meet Riparian Management Objectives. **FW-2.** Design, construct, and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of the Riparian Management Objectives or adversely affect listed anadromous and inland native fish. For existing fish and wildlife interpretive and other user-enhancement facilities inside Riparian Habitat Conservation Areas, assure that Riparian Management Objectives are met and adverse effects on listed anadromous and inland native fish are avoided. Where Riparian Management Objectives cannot be met or adverse effects on listed anadromous and inland native fish avoided, relocate, or close such facilities. **FW-3.** Cooperate with Federal, Tribal, and State wildlife management agencies to identify and eliminate wild ungulate impacts that prevent attainment of the Riparian Management Objectives or adversely affect listed anadromous and inland native fish. **FW-4.** Cooperate with Federal, Tribal and State fish management agencies to identify and eliminate adverse effects on native fish associated with habitat manipulation, fish stocking, fish harvest, and poaching. **RA-1** Identify and cooperate with Federal, Tribal, State and local governments to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat. **LH-4** Use land acquisition, exchange, and conservation easements to meet Riparian Management Objectives and facilitate restoration of fish stocks and other species at risk of extinction.	**FW-STD-CWN-01.** In Conservation Network Watersheds not meeting aquatic and riparian Conservation Strategy desired conditions, activities shall be designed and implemented in a manner that supports, and/or contributes towards the recovery of federally listed species and the achievement of these desired conditions and does not retard them when evaluated at the HUC12 subwatershed scale. Short-term adverse effects from project activities may occur when they support the long-term recovery of aquatic and riparian desired conditions and federally listed species. **FW-STD-WTR-02** Project-specific best management practices (BMPs), including both federal and state BMPs, shall be incorporated into project planning as a principal mechanism for controlling non-point pollution sources, to meet soil and watershed desired conditions, and to protect beneficial uses. **FW-STD-WTR-04.** Where aquatic and riparian desired conditions are being achieved, projects shall maintain those conditions. Where aquatic and riparian desired conditions are not yet achieved, and to the degree that project activities would contribute to those conditions, projects shall restore or not retard attainment of desired conditions. Short-term adverse effects from project activities may occur when they support the long-term recovery of aquatic and riparian desired conditions and federally listed species. Exceptions to this standard include situations where Forest Service authorities are limited (1872 Mining Law, state water right, etc.). In those cases, project effects shall not retard attainment of desired conditions for watersheds, to the extent possible within Forest Service authorities. **FW-STD-WTR-06.** To restore watersheds, management activities in watersheds with approved total maximum daily loads shall be designed to comply with the total maximum daily load allocations following project implementation.

Appendix F. Physical and Biological Features Crosswalk Table

Table 159 provides a crosswalk of critical habitat physical and biological features (PBF) for Bull Trout, Chinook Salmon, and Steelhead with revised plan components. Components listed below are the primary desired conditions, standards, and guidelines used to address the intent of each PBF; additional revised plan components not specifically listed here may also indirectly address PBFs.

Table 159. Crosswalk table for physical and biological features by species, with plan components addressing potential effects

Bull Trout	Chinook Salmon	Steelhead	Primary Revised Plan Components
1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.	water quality, quantity, temperature	water quality, water quantity	FW-DC-WTR-05, FW-DC-WTR-08, FW-STD-WTR-04, Section 2.2.2 Riparian Management Zones, FW-STD-ARGRZ-01, FW-STD-ARGRZ-02
2. Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.	free of artificial obstructions, safe passage, riparian vegetation, space	floodplain connectivity, free of artificial obstructions	*See components for PBF 1*, FW-DC-WTR-01, FW-DC-WTR-02, FW-DC-WTR-10, FW-DC-ARINF-01, FW-STD-ARINF-06
3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	food, natural cover,	forage	*See components for PBF 1*, FW-DC-WTR-03, FW-DC-WTR-10,
4. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments/ processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.	cover, shelter, riparian vegetation, natural cover, space	floodplain connectivity, free of artificial obstructions, natural cover	*See components for PBF 1;* FW-DC-WTR-01,03,04,06,07,09,10,11; FW-STD-WTR-04, FW-GDL-WTR-02; FW-DC-RMZ-01,02; FW-STD-RMZ-01,05,06,07; FW-STD-CWN-01; FW-STD-ARINF-07; FW-STD-AREM-01,03

Bull Trout	Chinook Salmon	Steelhead	Primary Revised Plan Components
5. Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.	water quality, quantity, temperature	water quality, water quantity	*See components for PBF 1;* FW-DC-WTR-03,04,05,07,08,10,11; FW-DC-RMZ-01,02; FW-STD-RMZ-07,06; FW-DC-CWN-01; FW-GDL-ARINF-01
6. In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.	spawning gravel, substrate	water quantity and floodplain connectivity to form and maintain physical habitat conditions	*See components for PBF 1;* FW-DC-WTR-06,10; FW-STD-WTR-04,06; FW-GDL-WTR-02,04,05,07; FW-DC-RMZ-01,02; FW-STD-RMZ-07,06; FW-GDL-RMZ-01,02,03,06,07,09; FW-OBJ-CWN-02; FW-DC-ARINF-01; FW-STD-ARINF-01,03,04,05; FW-GDL-ARINF-01,02,03,04,06,07,09; FW-STD-AREM-01,03
7. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph	water velocity	water quantity	FW-DC-WTR-07; FW-STD-ARLND-03,04; FW-GDL-ARINF-10
8. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.	water quality and quantity	water quality and quantity	See components for PBF 1, 5,7
9. Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.	No equivalent	No equivalent	FW-GL-WTR-01

Appendix G. Approach to Assess Water Yield and Peak Flow

The revised Land Management Plan employs a strategy of adaptive management in its decision-making and achievement of the Plan desired conditions and objectives. An adaptive management strategy emphasizes the learning process. It involves using the best current knowledge to design and implement management actions, followed by monitoring and evaluating results and adjusting future actions based on what has been learned. This is a reasonable and proactive approach to decision making considering the degree of uncertainty in future ecological, social, and economic factors.

This appendix describes possible actions, potential management approaches, and strategies the Nez Perce-Clearwater may undertake to make progress in achieving desired conditions and objectives.

This appendix does not serve as a "to do" list of projects. The potential management approaches may be used to inform future proposed and possible actions. These strategies and actions provide guidance for plan implementation, and represent possibilities, preferences, or opportunities, rather than obligatory actions. Under an adaptive management approach, proposed strategies and actions are dynamic. They are changeable, augmentable, or replaceable to be responsive to results of new research, practical experience, and other information and observations.

This appendix also provides information intended to clarify and provide additional information that may help managers interpret and implement plan components. Not all plan components are addressed, but only those for which additional information is warranted. This approach recognizes the highly variable site conditions and management situations that are best addressed at the level of project analysis.

This appendix does not commit the Nez Perce-Clearwater to perform or permit activities. Information included does not direct or compel processes such as analysis, assessment, consultation, planning, inventory, or monitoring.

Large forest vegetation removal projects have been linked to changes in stream flow (Bosch and Hewlett 1982, Stednick 1996, MacDonald and Stednick 2003, Grant et al. 2008, Troendle et al. 2010). Altered water yield and peak flow patterns have the potential to alter channel stability, such as (Tonina et al. 2008). The longest-standing quantitative method for characterizing prospective water yield change associated with forest harvest is the Equivalent Clearcut Area (ECA) method (U.S. Department of Agriculture 1974). Simply described, the ECA method collates the amount of cleared forested area in a watershed and then calculates change in water yield associated with the cleared area.

Traditional ECA application has commonly consisted of computing change in average annual acre-feet of runoff, excluding evaluation of changes in peak flow. The elevated stream energies associated with peak flows, however, are more likely to influence channel change than a minor increase in seasonal base flow. In some instances, change in acre-feet of water yield is not computed; rather, estimated percent change in canopy cover is compared with observed thresholds at which change in canopy cover has been documented to create a detectable change in water yield. This evaluation may be done in absence of other data when deciding as to whether change in water yield/peak flows is of concern. Note that ECA cannot account for spatial redistribution of snow in openings and associated changes in sublimation and/or forest canopy interception, only changes in evapotranspiration related to change in canopy cover.

Despite model limitations and inconsistencies in past applications, the ECA method is still a relatively simple and efficient means of evaluating change in evapotranspiration associated with tree harvest. At the time of Nez Perce-Clearwater forest plan revision, all process-based or empirically based models capable of providing more detailed evaluations of hydrograph response are either too complex to run on a project-by-project basis or do not provide accurate outputs at relevant scales for management. So, while the concept of ECA still applies, how the analysis is completed could be improved. The following describes an updated methodology for determining watershed-scale water change resulting from timber harvest.

All forest vegetation management projects should undertake an analysis of potential change in water yield. The analysis could consist of a weight-of-evidence approach that couples estimation of change in canopy cover extent with other ancillary data to inform whether a) water yield, in particular peak flows, may detectably change because of proposed forest management activities and b) whether that change may be of concern from a water quality and/or aquatic habitat perspective.

When conducted, water yield/peak flow analysis should typically be assessed at no greater than the HUC12 (i.e., 6^{th} code HUC) scale, if not also at a finer resolution as deemed appropriate by the scope of the proposed project and potential risks downstream (e.g. – water intake, Endangered Species Act species present). Analysis may not be required if there are no resources at risk or precipitation is less than 18 inches across the majority of the watershed in question (Troendle et al. 2010). ECA summation should account for past harvest activities while adjusting for evapotranspiration recovery over time using Callahan's (1996) recovery curves or a more site relevant and recent alternative.

Consider evaluating the ECA against a detectable threshold for change in peak flows. Recent literature has converged upon a 20 percent change in forest canopy as commonly producing a detectable change in peak flows and/or average annual water yield (MacDonald and Stednick 2003, Grant et al. 2008, Troendle et al. 2010). This ECA threshold, however, should be treated as a general guideline and can be superseded by newer literature, local monitoring, or professional judgement when appropriately justified.

When the ECA is at or near a threshold of concern, other data sources may need to be used to refine the predicted risk of change in peak flows, potential magnitude of change, and associated risk to water quality and aquatic habitat. Those other data sources may include, but not be limited to:

- Gridded water balance and/or runoff models characterizing watershed locations more and less likely to substantially contribute to runoff
- Historic vegetation condition and perceived level of departure from historic composition (thereby providing some idea of departure in annual hydrograph dynamics)
- Channel stability surveys and/or hydraulic analysis of bedload transport capacity
- Road density and percent of road network hydrologically connected to stream channels within the watershed or drainage of concern, and/or
- Applicable peer-reviewed literature. See, for example, figure 60 and figure 61 from Grant et al. (2008) and the proposed evaluation framework.

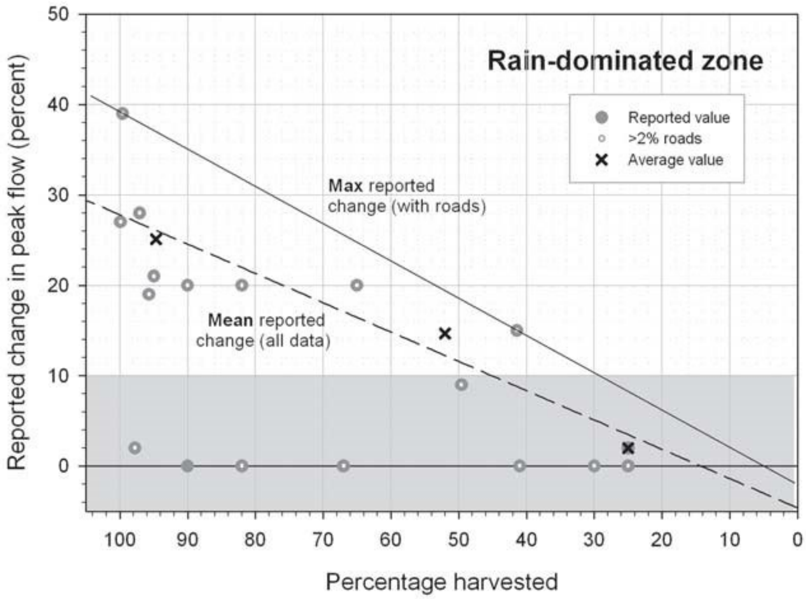

Figure 60. Peak flow response to harvest in the rain-dominated hydrologic zone. Solid line represents maximum values reported and includes the influence of roads. Dashed line is a linear fit through the average values from figure 8c, and represents the mean reported change for all data. Gray shading around zero indicates limit of detection (±10 percent). (From Grant et al., 2008:35)

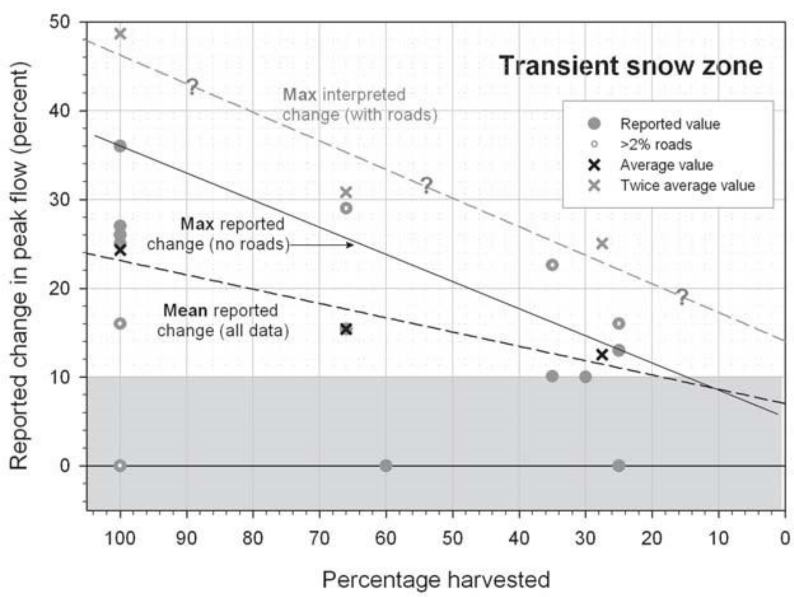

Figure 61. Peak flow response to harvest in the transient snow hydrologic zone. Solid line represents maximum values reported for basins without roads. Dashed black line is a linear fit through the average values from figure 8d, and represents the mean reported change for all data. Dashed gray line represents interpreted change with roads and is a linear fit through a doubling of the average values. Gray shading around zero indicates limit of detection (±10 percent). (From Grant et al., 2008:35, Figure 10)

Additionally, consider the spatial distribution and pattern of vegetation openings and road locations to help determine the likelihood of peak flow increases using figure 60. A greater weight of factors on the left side of figure 62 would lead to an interpretation of peak flow increases closer to the maximum response line shown in figure 60 and figure 61, whereas a greater weight on the right side would lead to an interpretation of increases at or below the mean response line. The outcome of this type of approach is not a single number for peak flow increases, but a plausible and defensible range of potential increases that is based on the preponderance of evidence and consistent with both data and inference (Grant et al. 2008).

Likelihood of peak flow increase: High	← →	Low	Potential considerations
High	Moderate	Low	**Road density**
All or most	Some	Few or none	**Road connectivity**
Fast	Moderate	Slow	**Drainage efficiency**
Large	Small	Thinned	**Patch size**
Absent	Narrow	Wide	**Riparian buffers**

Figure 62. Site conditions and management treatment considerations that potentially influence peak flows. Considerations are listed in decreasing likelihood of effect. Grayscale represents theoretical range in impact of each factor (black = high, white = low). (Figure and caption from Grant et al. (2008: 35, Figure 12)

If, after ECA analysis has been refined and resource concerns persist as they relate to increased peak flows and channel stability, adjustments to extent and intensity (i.e., amount of forest overstory removal) of silvicultural prescriptions may be required. These adjustments would be contingent upon the perceived risk to aquatic species, their associated habitat, and water quality.

Appendix H. Crosswalk of Applicable Forest Plan Components related to Canada lynx and/or Canada lynx habitat

Table 160. Applicable Forest Plan components related to Canada lynx or Canada lynx habitat

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
ALL	**FW-STD-WL-01**. Canada lynx habitat shall be managed in accordance with the Northern Rockies Lynx Management Direction (U.S. Department of Agriculture 2007d) and Record of Decision (U.S. Department of Agriculture 2007c).
ALL	**FW-GL-WL-01.** The Nez Perce-Clearwater cooperates and collaborates with the U. S. Fish and Wildlife Service, other federal agencies, state agencies, and tribes on conservation strategies, recovery plans, habitat management, and ecological conditions on National Forest System lands.
ALL	**FW-DC-WL-03**. The arrangement and distribution of vegetation patches is consistent with the natural range of variation and varies widely in size, shape, and structure to provide connectivity for native wildlife.
ALL	**FW-GL-WL-02.** The Nez Perce-Clearwater cooperates with highway managers, state agencies, tribes, and landowners to implement wildlife and aquatic organism crossings that reduce encounters and contribute to public safety.
ALL	**FW-GDL-WL-01:** New communication towers, new transmission lines, and associated infrastructure should be located and designed to avoid significant adverse effects on wildlife dispersal, migration, or critical habitat.
ALL	**FW-GL-TE-01:** The Nez Perce-Clearwater works with federal, state, tribal, and private land managers towards an all-lands approach to management and cooperation, including efforts to mitigate threats or stressors, provide for wildlife and fish habitat connectivity, and to provide social, economic and ecological conditions that contribute to mutual objectives.
ALL	**FW-GL-TE-02:** The Nez Perce-Clearwater cooperates with state agencies, federal agencies and tribes to develop actions that lead to progress towards meeting other agencies' objectives for native and desired non-native fish and wildlife species.
ALL	**FW-DC-TE-04:** Vegetation reflects natural disturbance regimes. The composition, structure, function, and connectivity of native plant communities are appropriate for a given landscape and climatic setting.

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
ALL	**FW-DC-TE-05:** Riparian vegetation includes native assemblages of hardwood trees, deciduous shrubs, conifers, and, where appropriate, unique coastal disjunct species**.**

Table 161. All Management Practices and Activities: The following objectives, standards and guidelines apply to management projects in lynx habitat in lynx analysis units (LAU) in occupied habitat and in linkage areas, subject to valid existing rights. They do not apply to wildfire suppression, or to wildland fire use.

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
Standard All S1: New or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area. **Objective All O1:** Maintain or restore lynx habitat connectivity in and between LAUs, and in linkage areas. **Guideline All G1:** Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal land. Methods could include fencing, underpasses, or overpasses. **Standard LAU S12:** Changes in LAU boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.	**FW-DC-WL-01:** The Nez Perce-Clearwater provides habitat conditions for federally listed threatened, endangered and candidate plant and animal species that contribute to their recovery to the point at which listing is no longer appropriate. Habitat used by federally listed species provides conditions to meet their life history needs. **FW-DC-WL-03:** The arrangement and distribution of vegetation patches is consistent with the natural range of variation and varies widely in size, shape, and structure to provide connectivity for native wildlife. **FW-GL-WL-02:** The Nez Perce-Clearwater cooperates with highway managers, state agencies, tribes, and landowners to implement wildlife and aquatic organism crossings that reduce encounters and contribute to public safety. **FW-GDL-WL-01.** New communication towers, new transmission lines, and associated infrastructure should be located and designed to avoid significant adverse effects on wildlife dispersal, migration, or critical habitat.**MA1 and MA2-DC-FOR-05:** Cold PVT Group: Landscape and within-patch patterns reflect historic fire regimes within the types represented here, which typically included mixed severity fire and stand replacing events. Patterns and patch size are guided by topography and land type changes or to meet desired conditions. **MA1 and MA2-DC-FOR-08:** Cool Moist PVT Group: Landscape and within-patch patterns reflect historic fire regimes within the types represented here, which typically included mixed severity fire and stand replacing events. Patterns and patch size are guided by topography and land type changes or to meet desired conditions.

Table 162. Vegetation Management: The following objectives, standards and guidelines apply to vegetation management projects in lynx habitat in lynx analysis units (LAUs) in occupied habitat. With the exception of Objective VEG O3 that specifically concerns wildland fire use, the objectives, standards, and guidelines do not apply to wildfire suppression, wildland fire use, or removal of vegetation for permanent developments such as mineral operations, ski runs, roads and the like. None of the objectives, standards, or guidelines apply to linkage areas.

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
Standard VEG S1: Unless a broad scale assessment has been completed that substantiates different historic levels of stand initiation structural stages limit disturbance in each LAU as follows: If more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects. Where and to what this applies: Standard VEG S1 applies to all vegetation management projects that regenerate forests, except for fuel treatment projects within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). In addition, fuel treatment projects may not result in more than three adjacent LAUs exceeding the standard. For fuel treatment projects within the WUI see guideline VEG G10.	**FW-DC-WL-03:** The arrangement and distribution of vegetation patches is consistent with the natural range of variation and varies widely in size, shape, and structure to provide connectivity for native wildlife. **MA1-DC-WILD-01:** Natural ecological processes and disturbances (e.g., succession, wildfire, avalanches, insects, and disease) are the primary forces affecting the composition, structure, and pattern of vegetation. **MA2-DC-RWILD-02:** Recommended wilderness areas are characterized by a natural environment where ecological processes and disturbances, such as natural succession, fire, avalanches, insects, and diseases, are the primary forces affecting the composition, structure, and patterns of vegetation. **FW-DC-TBR-04:** Harvests, including regeneration harvests, reflect the scale and pattern of natural disturbances. **FW-DC-TBR-05:** Timber harvest in the wildland urban interface reduces fuel loads and mitigates the risk of wildfire affecting the adjacent populated areas, and provide for safer firefighting conditions. **FW-STD-TBR-06.** The maximum opening size created by clearcutting, seed tree cutting, shelterwood seed cutting, or other cuts designed to regenerate an even-aged stand of timber in a single harvest operation shall be 40 acres. This standard applies to newly created harvest openings on National Forest System lands only and need not consider existing recently created opening on National Forest System lands, adjacent private lands, or other agency lands. Exceptions to the 40-acre maximum opening size standard may occur when determined necessary to help achieve desired ecological conditions for the plan areas. The desired conditions include providing for forest patterns, patch sizes and forest resilience both in the short- and long-term, as described in Section 2.1.3. The maximum opening size exception for the Nez Perce-Clearwater is 207 acres. **FW-STD-TBR-08:** FW-STD-TBR-06 and FW-STD-TBR-07 shall not apply to the size of harvest openings created because of natural conditions such as fire, insect and disease attack, or windstorm. **FW-STD-TBR-09:** Clearcutting will be used only where an interdisciplinary review has occurred, and the Responsible Official has concluded one of the following situations exist: Where conducting regeneration harvest in a stand dominated by tree species of an undesired dominance type and shade intolerant tree species are planned for regeneration. Clearcutting may be used where there are insufficient numbers of the desired species to retain as a seed source for the new stand.
Standard VEG S2: Timber management projects shall not regenerate more than 15 percent of lynx habitat on National Forest System lands within an LAU in a ten-year period. Where and to what this applies: Standard VEG S2 applies to all timber management projects that regenerate forests, except for fuel treatment projects within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). Standard VEG S5: Precommercial thinning projects that reduce snowshoe hare habitat may occur from the stand initiation structural stage until the stands no longer provide winter snowshoe hare habitat only: 1. Within 200 feet of administrative sites, dwellings, or outbuildings; or 2. For research studies or genetic tree tests evaluating genetically improved reforestation stock; or	

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
3. Based on new information that is peer reviewed and accepted by the regional level of the Forest Service, and state level of FWS, where a written determination states: a. that a project is **Not Likely to Adversely Affect** lynx; or b. that a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat; or 4. For conifer removal in aspen, or daylight thinning around individual aspen trees, where aspen is in decline; or 5. For daylight thinning of planted rust-resistant white pine where 80 % of the winter snowshoe hare habitat is retained; or 6. To restore whitebark pine. Exceptions 2 through 6 shall only be utilized in LAUs where Standard VEG S1 is met Where and to what this applies: Standard VEG S5 applies to all precommercial thinning projects, except for fuel treatment projects that use precommercial thinning as a tool within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects within the WUI see guideline VEG G10. Standard VEG S6: Vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late successional forests may occur only: 1. Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or 2. For research studies39 or genetic tree tests evaluating genetically improved reforestation stock; or 3. For incidental removal during salvage harvest42 (e.g., removal due to location of skid trails Where and to what this applies: Standard VEG S6 applies to all vegetation management projects except for fuel treatment projects within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent	Where conducting regeneration harvest in a stand of lodgepole pine. Where conducting regeneration harvest and most or all overstory trees are infected by insect or disease and where clearcutting is the optimal silvicultural system of ensuring future stands are not infected, as in the case of dwarf mistletoe. Where a site-specific finding determines that clearcutting is the optimum system to move towards desired conditions. **FW-STD-TBR-10:** Seedtree harvest will be used only where an interdisciplinary review has occurred, and the Responsible Official has concluded one of the following situations exist: Where conducting regeneration harvest and shade intolerant tree species are planned for regeneration. Seedtree cutting may be used where a sufficient number disease free individuals of the desired species are available to retain as a seed source for the new cohort. Where a site-specific finding determines that seedtree cutting is the optimum system to move towards desired conditions. **FW-STD-TBR-11:** Shelterwood harvest will be used only where an interdisciplinary review has occurred, and the Responsible Official has concluded one of the following situations exist: Where conducting regeneration harvest and shade intolerant tree species are planned for regeneration. Shelterwood cutting may be used where there are concerns over frostiness or high insolation rates on a site. Where a stand of root disease susceptible trees exists on soils where slope stability is a concern. Shelterwood harvest may be used to produce a cohort of root disease tolerant species. Where a site-specific finding determines that shelterwood cutting is the optimum system to move towards desired conditions. **FW-GDL-TBR-04**: On lands suited for timber production, even-aged stands should generally have reached or surpassed culmination of mean annual increment (95 percent of CMAI, as measured by cubic volume) prior to regeneration harvest. Table 23 gives ages at which culmination generally occurs. Stands need not have met CMAI prior to regeneration harvest if one of the following conditions have been identified during project development: When such harvesting would assist in reducing fire risk within wildland urban interface or the community protection zone. When insect and disease mortality has exceeded endemic levels. When harvesting of stands, landscapes will trend toward the desired conditions stated in this plan. When harvest is thinning, stand improvement, or uneven-aged systems do not regenerate even-aged or two-aged stands.

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
(cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects within the WUI see guideline VEG G10. **Objective VEG 01:** Manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx. **Objective VEG 02:** Provide a mosaic of habitat conditions through time that support dense horizontal cover, and high densities of snowshoe hare. Provide winter snowshoe hare habitat in both the stand initiation structural stage and in mature, multi-story conifer vegetation. **Objective VEG 03:** Conduct fire use activities to restore ecological processes and maintain or improve lynx habitat. **Objective VEG 04:** Focus vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover. **Guideline VEG G1:** Vegetation management projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority for treatment should be given to stem-exclusion, closed-canopy structural stage stands to enhance habitat conditions for lynx or their prey (e.g., mesic, monotypic lodgepole stands). Winter snowshoe hare habitat should be near denning habitat. **Guideline VEG G4:** Prescribed fire activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided. **Guideline VEG G5:** Habitat for alternate prey species, primarily red squirrel, should be provided in each LAU. **Guideline VEG G10:** Fuel treatment projects within the WUI as defined by HFRA should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation. **Guideline VEG G11:** Denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees ("jack-strawed" piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles, or residual trees to provide denning habitat in the future.	When harvest is for sanitation or salvage of timber stands that have been substantially damaged by fire, wind-throw, or other catastrophe, or which are in imminent danger from insect or disease attack. When harvest is on lands not suited for timber production and the type and frequency of harvest is due to the need to protect or restore multiple use values other than timber production, or to move the area towards desired conditions. **FW-DC-FOR-10:** Cool Moist PVT Group - Within-stand characteristics for the Cool Moist potential vegetation type group within Management Area 1, Management Area 2, and Management Area 3: Where subalpine fir and Engelmann spruce dominate, stand level structure is often multi-storied. Where other species dominate, structure is even-aged or two-aged with live legacy trees and snags from previous disturbance persisting well into the next generation. These live legacy trees and snags, which are important as habitat for cavity nesting wildlife, are primarily the largest western larch, western white pine, Douglas-fir, and whitebark pine and they are present and distributed across the potential vegetation type group. Whitebark pine of all sizes is present on the colder habitat types within this potential vegetation type group. **MA1 and MA2-DC-FOR-09, MA3-DC-FOR-07:** Cold PVT: Where subalpine fir and Engelmann spruce dominate, stand level structure is often multi-storied. Where other species dominate, structure is even- aged or two-aged with live legacy trees and snags from previous disturbance persisting well into the next generation. These live legacy trees and snags are present and distributed across the potential vegetation type group. Whitebark pine of all sizes is present on the colder habitat types within this potential vegetation type group. **FW-DC-FOR-12:** Cold PVT Group - Size class distribution within Management Area 1, Management Area 2, and Management Area 3: Across each management area, the cold potential vegetation type group consists of the distribution of size classes. **MA1 and MA2-DC-FOR-05:** Cold PVT Group: Landscape and within-patch patterns reflect historic fire regimes within the types represented here, which typically included mixed severity fire and stand replacing events. Patterns and patch size are guided by topography and land type changes or to meet desired conditions. **MA1 and MA2-DC-FOR-08:** Cool Moist PVT Group: Landscape and within-patch patterns reflect historic fire regimes within the types represented here, which typically included mixed severity fire and stand replacing events. Patterns and patch size are guided by topography and land type changes or to meet desired conditions. **MA3-DC-FOR-06, MA3-DC-FOR-09:** Cool Moist and Cold PVT Group: The pattern on the landscape is a mosaic of size classes. Patches of different size classes vary in extent, consistent with typical historical fires, and they are

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
	generally bounded by ridges, streams, and other topographic features. Patches of the 0 – 4.9” diameter at breast height size class contain larger live trees in patterns consistent with historic mixed severity fire patterns and/or addressing land type concerns or management objectives. **FW-DC-FIRE-01:** Restore and Maintain Landscapes: Landscapes across the Nez Perce-Clearwater are resilient to fire-related disturbances in accordance with management objectives. Natural fuel conditions emulate the structure, species mix, spatial pattern, extent, and resiliency of the historic fire regime of the area. Wildland fires burn with a range of intensity, severity, and frequency that allows ecosystems to function in a healthy and sustainable manner and meet desired conditions for other resources. **FW-DC-FIRE-02:** The full range of fire management activities, including both prescribed fire and natural wildfire, are recognized and used by Nez Perce-Clearwater administrators as an integral part of achieving ecosystem sustainability, including interrelated ecological, economic, and social components, such as improved ecosystem resilience and wildlife habitat, protection of property, other values at risk, and public safety. **MA1-DC-WILD-01:** Natural ecological processes and disturbances (e.g., succession, wildfire, avalanches, insects, and disease) are the primary forces affecting the composition, structure, and pattern of vegetation. **MA1-DC-WILD-02:** Wilderness areas provide opportunities for visitors to experience natural ecological processes and disturbances with a limited amount of human influence. **MA2-DC-IRA-02:** The composition, structure, and pattern of vegetation reflect natural disturbances and follow Idaho Roadless Rule themes, as assigned. **MA2-DC-IRA-03:** These areas contribute habitats for wide ranging species and connectivity for movement of wildlife. These areas also provide foraging, security, denning, and nesting habitat for wildlife.

Table 163. Livestock Management: The following objectives and guidelines apply to grazing projects in lynx habitat in lynx analysis units (LAU) in occupied habitat. They do not apply to linkage areas

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
Objective GRAZ O1: Manage livestock grazing to be compatible with improving or maintaining lynx habitat. **Guideline GRAZ G1:** In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating	**FW-DC-GRZ-01:** Within the planning area, the Nez -Perce -Clearwater provides forage for domestic livestock grazing consistent with the capacity of the land to produce sustained forage for multiple uses. This includes transitory forage made available following the reduction in conifer overstory from fire and timber harvest. Livestock grazing on the Nez -Perce- Clearwater contributes to agricultural businesses and local employment opportunities, as well as supporting traditional lifestyles.

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
Guideline GRAZ G2: In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen **Guideline GRAZ G3:** In riparian areas and willow carrs, livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes. **Guideline GRAZ G4:** In shrub-steppe habitats, livestock grazing should be managed in the elevation ranges of forested lynx habitat in LAUs, to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.	**FW-GDL-GRZ-01:** To reduce localized impacts resulting from concentrated livestock use and associated trampling, livestock salting should be excluded from riparian areas, meadows, designated sensitive plant habitat, seedling conifer regeneration areas, and prescribed restoration areas.

Table 164. Human Use Projects: The following objectives and guidelines apply to human use projects, such as special uses (other than grazing), recreation management, roads, highways, and mineral and energy development, in lynx habitat in lynx analysis units (LAU) in occupied habitat, subject to valid existing rights. They do not apply to vegetation management projects or grazing projects directly. They do not apply to linkage areas

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
Objective HU O1: Maintain the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat. **Objective HU O2:** Manage recreational activities to maintain lynx habitat and connectivity. **Objective HU O3:** Concentrate activities in existing developed areas, rather than developing new areas in lynx habitat. **Objective HU O5:** Manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat. **Objective HU O6:** Reduce adverse highway effects on lynx by working cooperatively with other agencies to provide for lynx movement and habitat connectivity, and to reduce potential of lynx mortality. **Guideline HU G1:** When developing or expanding ski areas, provisions should be made for adequately sized inter-trail islands that include coarse woody debris, so winter snowshoe hare habitat is maintained. **Guideline HU G2:** When developing or expanding ski areas, lynx foraging habitat should be provided consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes.	**FW-GL-WL-02:** The Nez Perce-Clearwater cooperates with highway managers, state agencies, tribes, and landowners to implement wildlife and aquatic organism crossings that reduce encounters and contribute to public safety.**FW-GDL-WL-01.** New communication towers, new transmission lines, and associated infrastructure should be located and designed to avoid significant adverse effects on wildlife dispersal, migration, or critical habitat.**FW-DC-ARREC-01:** Recreation facilities and their use, including trails and dispersed sites, have minimal impacts on aquatic resources, including threatened and endangered species, designated critical habitat, and species of conservation concern. **FW-DC-LND-01:** Land ownership, rights-of-way, and conservation easements provide access for recreation, and facilitate restoration or conservation of high value resources, including habitat for at-risk species and significant cultural sites. **FW-DC-LND-04:** Energy corridor infrastructure throughout the planning area provides efficient and effective delivery of electricity, oil, and gas and enhances the western electric transmission grid by improving reliability, reducing congestion, and contributing to the national electrical grid. **FW-DC-LND-05:** Existing communication sites are utilized to provide communication for the Nez Perce- Clearwater and other government entities and to meet various public needs. Obsolete or unused facilities are not present on the landscape. **FW-GDL-ES-01:** To provide for social and economic sustainability of rural communities, access to activities such as recreation, hunting, fishing, gathering, egress and wildfire management should continue to be provided for on routes or

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
Guideline HU G3: Recreation developments and operations should be planned in ways that both provide for lynx movement and maintain the effectiveness of lynx habitat. **Guideline HU G4:** For mineral and energy development sites and facilities, remote monitoring should be encouraged to reduce snow compaction. **Guideline HU G5:** For mineral and energy development sites and facilities that are closed, a reclamation plan that restores lynx habitat should be developed. **Guideline HU G6:** Methods to avoid or reduce effects to lynx should be used in lynx habitat when upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development. **Guideline HU G7:** New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity. New permanent roads and trails should be situated away from forested stringers. **Guideline HU G8:** Cutting brush along low-speed, low-traffic-volume roads should be done to the minimum level necessary to provide for public safety. **Guideline HU G9:** On new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives. **Guideline HU G10:** When developing or expanding ski areas and trails, consider locating access roads and lift termini to maintain and provide lynx security habitat, if it has been identified as a need. **Guideline HU G11:** Designated over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction1, unless designation serves to consolidate use and improve lynx habitat. This may be calculated on an LAU basis, or on a combination of immediately adjacent LAUs. This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings, or to access regulated by Guideline HU G12. Use the same analysis boundaries for all actions subject to this guideline. **Guideline HU G12:** Winter access for non-recreation special uses and mineral and energy exploration and development, should be limited to designated routes or designated over-the-snow routes.	in areas designated as open to motorized use in the summer and winter. If a route is identified as adversely affecting aquatic ecological values, rerouting and route improvement should be considered prior to closure, to preserve motorized access opportunities. If a route or area needs to be closed, alternate motorized access to maintain social and economic sustainability of rural communities should be provided.**MA2-DC-RWILD-03:** Recommended wilderness areas facilitate the connectivity and movement of wildlife species across the Nez Perce-Clearwater by remaining large areas with little human activity.

Table 165. Linkage Areas: The following objective, standard and guidelines apply to all projects within linkage areas in occupied habitat, subject to valid existing rights

Northern Rockies Lynx Management Direction Standards/Objectives/Guidelines	Supporting/Complimentary Plan Components
Objective LINK O1: In areas of intermingled land ownership, work with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential adverse impacts on lynx and lynx habitat. Standard Link S1: When highway or forest highway construction or reconstruction is proposed in linkage areas, identify potential highway crossings **Guideline LINK G1:** National Forest System lands should be retained in public ownership. **Guideline LINK G2:** Livestock grazing in shrub-steppe habitats should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.	**FW-GL-WL-02:** The Nez Perce-Clearwater cooperates with highway managers, state agencies, tribes, and landowners to implement wildlife and aquatic organism crossings that reduce encounters and contribute to public safety. **FW-GDL-WL-01.** New communication towers, new transmission lines, and associated infrastructure should be located and designed to avoid significant adverse effects on wildlife dispersal, migration, or critical habitat. **FW-DC-LND-01:** Land ownership, rights-of-way, and conservation easements provide access for recreation, and facilitate restoration or conservation of high value resources, including habitat for at-risk species and significant cultural sites.

Appendix I. Lynx Mapping Section from Draft Forest Plan Assessment

Lynx Habitat Mapping

The Northern Rockies Lynx Management Direction (NLRMD) (U.S. Department of Agriculture 2007d) and the LCAS (Ruediger et al. 2000a) outlined a number of criteria that should be considered in the mapping of lynx habitat. This information provided the starting point for lynx habitat mapping. On August 22, 2000 additional guidance was provided to field units by the Deputy Regional Forester, USFS Region 1, the Region 6 Director of the FWS, and the Group Manager for Fish, Wildlife, and Forests of the BLM in a document titled "Lynx Habitat Mapping Direction," based on recommendations by the Lynx Steering Committee. The Lynx Steering Committee developed a set of mapping criteria and procedures to guide and clarify the mapping process. The consequences of applying these criteria were also assessed. Subsequent references to this document will be as "recommendations by the Lynx Steering Committee 2000."

Mapping of primary habitat should be based on forest types necessary to support lynx survival and reproduction specific to each geographic area (Ruediger et al. 2000a, Interagency Lynx Biology Team 2013). In northern and central Idaho this consists of subalpine fir, Engelmann spruce, and lodgepole pine potential vegetation types (Interagency Lynx Biology Team 2013). The LCAS indicated that Lynx Analysis Units (LAUs) should be developed and used to map lynx habitat, determine habitat conditions, and assess management effects to lynx. A lynx analysis unit is delineated to represent a home range of a female lynx. Habitat mapping criteria were developed to represent important life history characteristics: foraging and denning. Lynx analysis unit delineations and habitat mapping actions directed by the LCAS (Ruediger et al. 2000b) were completed for both Forests. The Nez Perce National Forest mapped lynx habitat on the Forest between 2000 and 2002 and then revised the mapped habitat in 2004. The Clearwater National Forest revised its mapped lynx habitat in 2007. This mapping was completed in coordination with the FWS.

In 2014, as part of the Forest Plan Revision, mapped lynx habitat was revised to develop consistent mapping criteria across both Forests, and to include the best available scientific information (BASI) concerning lynx population dynamics, distribution, habitat use, competitor interactions, prey species, and human interactions that has become available since 2007. This mapping was also completed in coordination with the U.S. Fish and Wildlife Service. This process resulted in the mapping of 78 lynx analysis units across the Nez Perce–Clearwater National Forests (figure 63 and figure 64). Lynx Analysis Units will be used to display the amount, relative quality, and distribution of lynx habitat across the Forests.

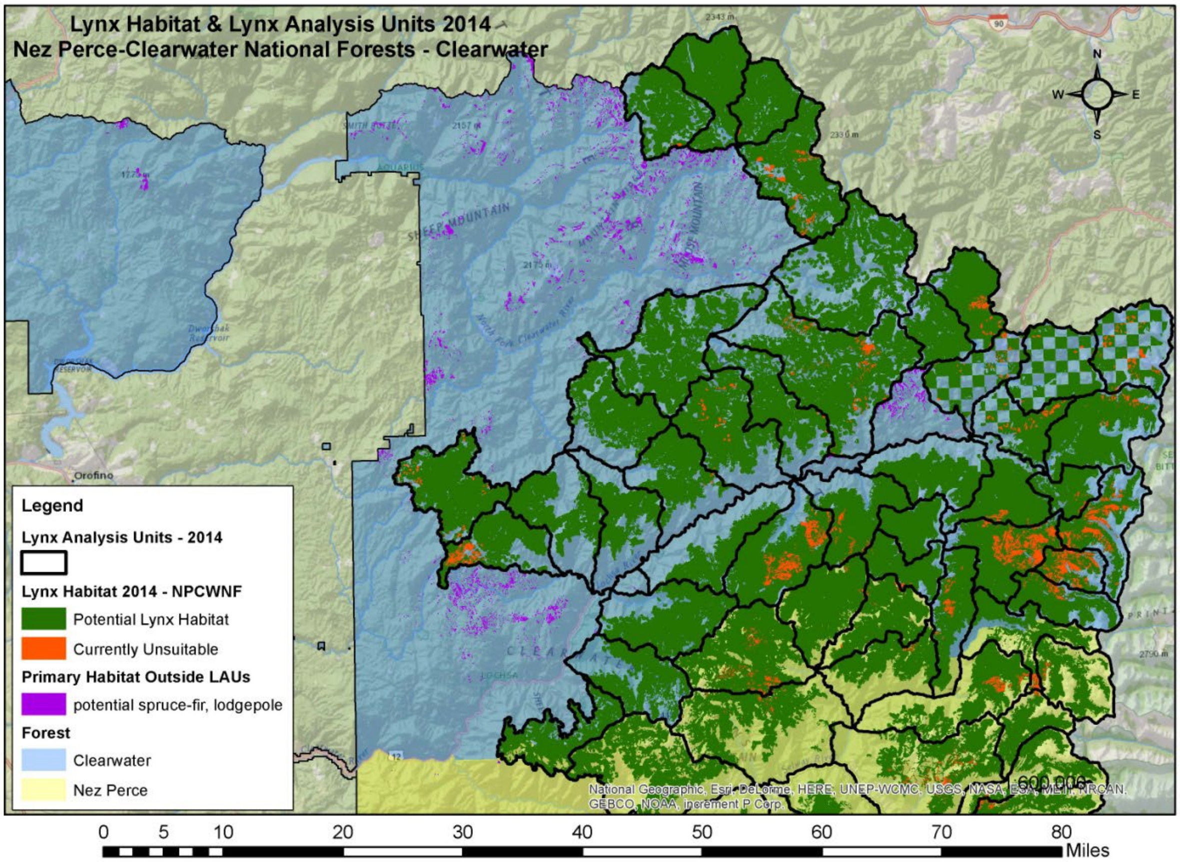

Figure 63. Lynx habitat and analysis units for the Clearwater National Forest portion of the Nez Perce–Clearwater National Forests

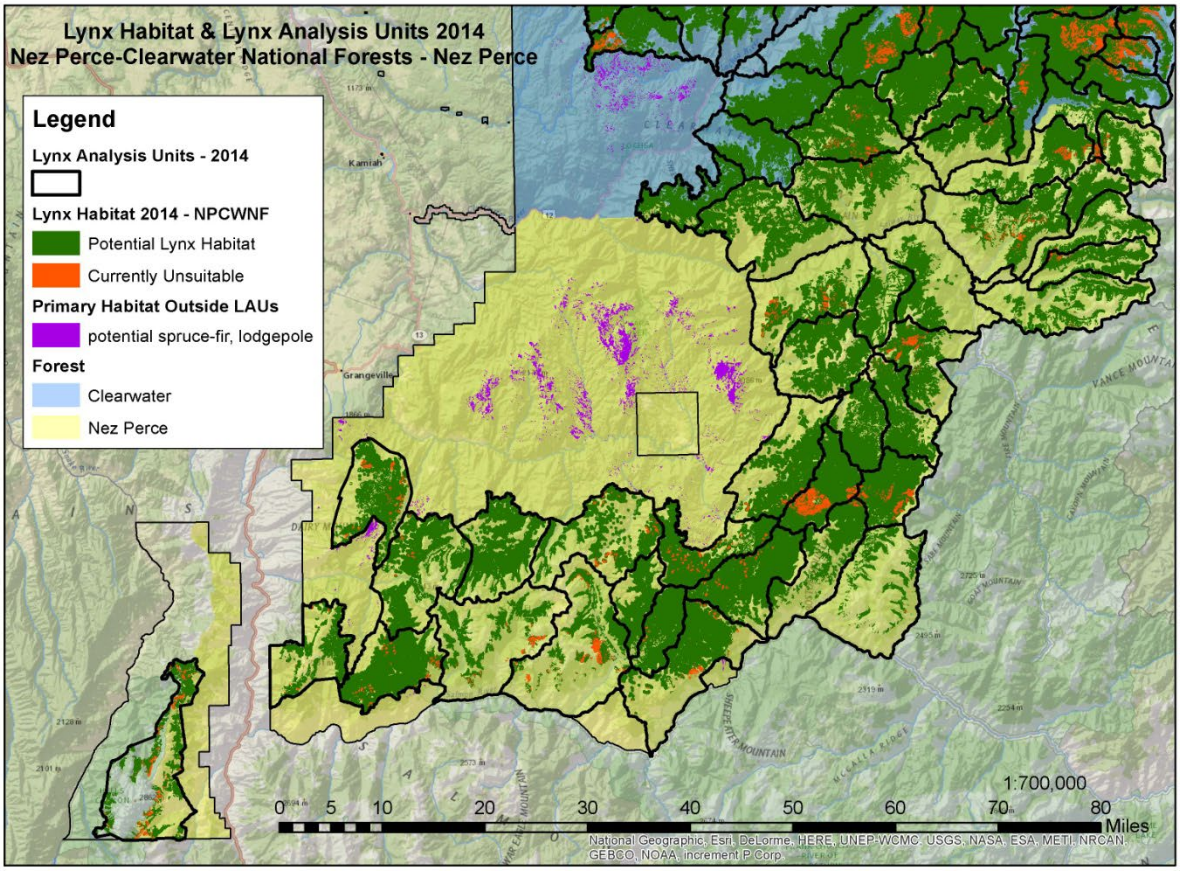

Figure 64. Lynx habitat and analysis units for the Nez Perce National Forest portion of the Nez Perce–Clearwater National Forests

Mapping Criteria

Potential natural vegetation types were the basis for mapping lynx habitat on the Nez Perce–Clearwater National Forests because they represent the ecological potential for an area to support primary lynx habitat. Potential vegetation is a landscape scale classification that delineates expected vegetation type groups using ecosystem attributes such as land type, soils, topography, climate, and geographic location. Potential vegetation types define sites within a climatic region that have the potential to produce similar vegetation. Classifications of potential vegetation are often associated with well-documented stable vegetation communities or habitat types that occur in the absence of disturbance (Cooper et al. 1991).

Important advantages exist when using potential vegetation type groups rather than existing vegetation for lynx mapping. Existing vegetation better describes the variability in vegetation cover that exists because of disturbance and seral stage; however, potentially suitable lynx habitat would be underestimated if defined using existing vegetation because stands affected by stand-replacing wildfires and regeneration harvest, which produce stands in initiation structural stage, are reflected in existing vegetation. Forest managers need to consider that stands in early stand initiation stage and stands in stem exclusion stage are potential lynx habitat even if they cannot currently support lynx.

Potential Vegetation Model Selection

Potential Vegetation Type (PVT) classification for western Montana and northern Idaho completed in 2004 for Region 1 were used as the basis for mapping lynx habitat. We considered 3 existing mapped models of landscape classification for their usefulness in delineating potential vegetation types that characterize lynx habitat: (1) Vegetative Response Units (VRU) available for the Nez Perce National Forest (figure 63), (figure 64) the Land Type Associations (LTA) for the Clearwater National Forest (figure 63), and (3) Potential Vegetation Types for Region 1 (PVT) (figure 64). We did not consider using stand-based Habitat Type Groups (HTG) provided in Field Sampled Vegetation (FSVeg) (U.S. Department of Agriculture 2005a). Although HTG are classifications of potential natural vegetation types, in FSVeg they are based on individual stand assessment determined from common stand exams, which are not appropriate input for landscape-level modeling. They are not appropriate because they are based on a project-level sampling design and the level of data collection and accuracy requirements are highly spatially varied (Bush 2014).

After reviewing the classifications and mapped distributions for the three landtype models (PVT, VRU, and LTA), we selected PVT to define potential lynx habitat. PVT is an ecoregional model based on spatially referenced field data that refers to habitat type and has been extrapolated across the region using climate data, solar radiation, potential lifeform, elevation, aspect, slope, and soils data (Appendix A). One basic advantage of using PVT is that it provides seamless and consistently determined coverage regardless of ownership across both Forests. Additionally, PVT classes are combined into groups based on seral tree species that we were able to cross-reference to habitat types (Cooper et al. 1991) and HTGs (U.S. Department of Agriculture 2005c) using lookup tables provided by Region 1 (USDA Forest Service Region One Renewable Resource Management) and the appendices in Chew et al. (2012a), which provided us with a method for selecting PVT classes that are suitable lynx habitat.

We recognized that using PVT as a basis for lynx habitat mapping had certain limitations. The metadata for the PVT model does not provide accuracy statistics and, other than the metadata, we could not find a report or document of the model-building. In addition, the model is designed for characterizing broad-scale patterns; and, although it is mapped at a 90-meter resolution, the metadata warns that, "the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres (for example, assessments that typically require 1:24,000 data)." However, we reviewed other potential vegetation models and felt that PVT out-performed the other systems in terms of being able to predict areas that support primary lynx habitat. In addition, although the Regional Geospatial Analysis Team recognizes the model needs to be updated (J. Barber, GIS specialist, Engineering, USFS Region 1, Missoula, MT, pers. comm.), it is currently the accepted model for potential vegetation in the Region. Of 7 lynx habitat remapping efforts currently in progress in Region 1, 6 National Forests are using PVT (J. Barber pers. comm.). PVT was proven to be reasonable for predicting lynx locations on the Flathead National Forest where 94–95 percent of the locations of 8 radio-collared lynx were within PVT where it equaled one of four subalpine fir (Abies lasiocarpa) classes (U.S. Department of the Interior 2013c). The same location data were not sensitive to existing vegetation in the Forest Service Region 1 Vegetation Map Product (VMap) (Barber et al. 2011) dominance type classes.

We were not compelled to use a combination of LTAs and VRUs for the Forests after exploring how effective the systems were in defining potential lynx habitat. The primary reason was that both systems delineate multiple classes that include other habitat types that are considered secondary habitat (grand fir (Abies grandis), mountain hemlock (Thuja mertensiana), western redcedar (Thuja plicata), and Douglas-fir (Pseudotsuga menziesii)) in addition to subalpine fir habitat types When we reviewed the distribution of potential primary habitat as selected by the different systems, 18 percent more area of the Nez Perce National Forest was selected by VRUs than PVT and 10 percent more area of the Clearwater National

Forest was selected by LTA groups than PVT, which we attributed to the inclusion of the secondary habitat types. We did not just assume that less primary habitat meant the PVT was more accurate, rather we carefully reviewed the differences in GIS using satellite imagery and existing vegetation maps (VMap and FSVEG) and determined that LTA groups and VRUs delineated areas as primary lynx that would not be spruce-fir or lodgepole pine habitat types. Additionally, when we reviewed the distributions of potential primary habitat adjacent to the border between the two Forests, we saw major differences in distribution that could have been a result of the different methods used for classification for the two systems; LTAs are primarily based on soil and water attributes, while the VRUs are primarily based on vegetative components, disturbance regime, and successional pathways (U.S. Department of Agriculture 2013).

Primary Habitat

Mapping of primary habitat should be based on forest types necessary to support lynx survival and reproduction specific to each geographic area (Ruediger et al. 2000b, Interagency Lynx Biology Team 2013), which in northern and central Idaho is subalpine fir, Englemann spruce, and lodgepole pine potential vegetation types (Interagency Lynx Biology Team 2013). We used PVT classes to delineate lynx primary habitat potential to produce forests dominated by subalpine fir, Englemann spruce, or lodgepole pine. The PVT model has 4 classes of potential vegetation dominated by subalpine fir, one class dominated by spruce, and one class dominated by lodgepole pine (figure 64).

Secondary Habitat

Where it is interspersed with primary habitat, cedar-hemlock, grand fir, or Douglas-fir on moist sites at higher elevations in central Idaho support snowshoe hares (Murray et al. 2002) and may provide secondary habitat for lynx (Interagency Lynx Biology Team 2013). Secondary habitat was selected from PVT classes where these tree species were dominant and where it was directly adjacent to primary habitat. Because lynx are not associated with these forest types (Interagency Lynx Biology Team 2013) but because they do support snowshoe hares, we only included secondary habitat within 200 meters of primary habitat. There are multiple PVT classes for which each of these tree species is the dominant habitat type (e.g., abgr1, abgr2, abgr3 for grand fir); so we reviewed the PVT description and cross referenced the habitat types and habitat type groups that were associated with each PVT class using lookup tables provided by Region 1 (USDA Forest Service Region One Renewable Resources Management) and the appendices in Chew et al. (2012a) (figure 64).

We thoroughly researched the different habitat types (Cooper et al. 1991) and HTGs (U.S. Department of Agriculture 2005b) to determine which were capable of providing the dense horizontal cover to support snowshoe hares. The pvt classes we selected for secondary habitat include: abgr2, abgr3, thpl2, tshe, tsme1, tsme2, tsme3, and psme 2 but only where psme2 is on the Clearwater National Forest and above 4,000 ft elevation. For the discussion on secondary habitat, any information on habitat types comes from Cooper et al. (1991), the information about HTG comes from USDA Forest Service (2005b), and the table we used to cross reference habitat types is figure 64 of this document. Many of the PVT classes included both (a) habitat types that were capable, and (b) habitat types that were unlikely, to provide habitat. Because secondary habitat must be directly adjacent to the primary habitat to be selected in the lynx habitat model and because it was to be cut off 200 meters from any primary habitat, we tended toward being inclusive. We reasoned that habitat types that were too warm or dry to be suitable as secondary habitat were not likely to be growing within 200 meters of primary habitat and would not be selected anyway.

We selected two grand fir classes: abgr2 and abgr3 (figure 64). Abgr2 is in HTG 3, which is a group of moderately warm and moderately dry habitat types, so we were originally not going to include it as potential secondary habitat. However, abgr2 includes one series with Vaccinium globulare (blue huckleberry) as the main undergrowth species, and another habitat type where subalpine fir and spruce can be co-dominant and huckleberry can be present in the shrub layer. Huckleberry is often present in known lynx habitat (Squires et al. 2010) and has the potential to provide cover and forage for snowshoe hare, so we included this PVT class as secondary habitat. Abgr3 includes ABGR/Asarum caudatum (ASCA) (wild ginger), ABGR/Clintonia uniflora (CLUN) (queen's cup), and ABGR/Senecio triangularis (SETR) (ragwort) series, which are in HTG 4. Menziesia ferruginea (MEFE) is a shrub species that is often present in known lynx habitat (Squires et al. 2010, Interagency Lynx Biology Team 2013) and potentially provides cover and forage for snowshoe hare (Wirsing et al. 2002). MEFE is a phase of both ABGR/ASCA and ABGR/CLUN series, which provided more support for selecting it as potential secondary habitat.

In northern Idaho, cedar-hemlock habitat types were previously thought to support lynx but are currently thought to only be potentially secondary habitat (Interagency Lynx Biology Team 2013). Two PVT cedar classes exist (wet type 1 and moist type 2). We did not include the wet type because it includes habitat types that grow in elevations that are too low (1,500–4,700 feet) to be considered snowshoe hare habitat. We selected the cedar moist type 2 and western hemlock habitat type because they include phases with MEFE and therefore have the potential to provide hare foraging habitat. We included all PVT classes with mountain hemlock as the dominant tree species (tsme1, tsme2, tsme3 [Table 5 3]). Mountain hemlock is in the same cool HTGs (7 and 8) as spruce-fir habitat types; it grows in subalpine elevations and has suitable horizontal structure in the understory because the undergrowth is dominated by MEFE. Blue huckleberry (Vaccinium globulare (VAGL) is also well represented.

Moist high-elevation Douglas-fir habitat types in central Idaho potentially contribute to lynx habitat (U.S. Department of Agriculture 2000;2007c). In central Idaho, Douglas-fir habitat types are varied and are distributed over a broad range of habitat types (Cooper et al. 1991). On the Nez Perce—Clearwater National Forests, most of the moist Douglas-fir habitat types are PSME/Physocarpus capitatus (PHCA) (ninebark) series. On the Nez Perce National Forest, these habitat types lack the characteristics necessary to provide hare habitat as spruce and lodgepole pine are generally negligible components and tall shrubs are limited (P. Green, data analyst, USFS Region 1, NPCNF, pers. comm.). On the Clearwater National Forest PSME/PHCA above 4,000 feet might be suitable secondary habitat (P. Green pers. comm.), so we only considered PVT with PSME on the Clearwater National Forest above 4,000 ft. We used the PVT class psme2 because it included the PSME/PHCA series that is potentially suitable as secondary habitat.

Elevation

In northwest Montana, lynx occupy subalpine elevations between 4,134 and 7,726 feet (Squires et al. 2010). The LCAS did not directly provide elevation ranges specific to central Idaho but in the August 22, 2000 additional guidance based on recommendations by the Lynx Steering Committee 2000, it was recommended that areas below 4,000 feet should "usually" be excluded from mapping. Snow is a defining characteristic of winter lynx habitat, and the snow is deeper in areas used by lynx compared to random availability (Squires et al. 2010). The upper limits of lynx habitat are the upper limits of subalpine forest cover. Lynx select home ranges with high canopy cover (Squires et al. 2013). Ranges above the subalpine zone tree cover are too sparse to support lynx.

Nez Perce–Clearwater National Forests have deep snows in the winter, but the elevation band of persistent snow is higher than on the east side of the Continental Divide (M. Bienkowski, silviculturist, USFS Region 1, NPCNF, pers. comm.). We therefore considered raising the minimum elevation in the mapping to higher than 4,000 ft. However, throughout the course of evaluating a preliminary map of primary habitat and discussing the matter with Bryon Holt, U.S. Fish and Wildlife Service, Northern Idaho Field Office, Spokane, WA, we decided against having a lower elevational limit to the lynx habitat map. Potential spruce-fir habitat rarely occurs below 4,000 ft on the Nez Perce–Clearwater National Forests, but when it does, we decided it could be within natural pockets affected by topographic features and climate; and we did not want to exclude potentially suitable habitat based on elevation alone.

We excluded potential habitat above 7,000 ft because of sparse tree cover above this elevation on the Nez Perce–Clearwater National Forests. The selected PVT classes for primary habitat included much of the area above 7,000 ft on the Nez Perce–Clearwater National Forests. After carefully reviewing the high elevation potential primary habitat over satellite imagery and VMap and FSVEG in GIS, we determined that, above 6,800–7,000 ft, very few conifer stands of a size were in existence to support snowshoe hare and lynx.

Denning

Denning habitat is used by females in the late winter and early spring while giving birth and rearing kittens. In northwest Montana, lynx dens were located in mature multi-storied stands of spruce-fir with high horizontal cover, abundant coarse woody debris, and higher canopy closure (Squires et al. 2008). Lynx prefer to den in coarse woody debris such as large diameter mature downed trees or small-diameter piled logs, but will also use protected areas in talus and boulders, disease-infected forests, etc. (Squires et al. 2008). To delineate denning habitat within our map of potential lynx habitat, we used maps of existing vegetation (VMap) to select mature stands with high canopy closure. We selected stands with ≥ 40 percent canopy cover and used large trees as an indicator for mature forest by selecting for stands with trees with ≥ 15-inch diameter at breast height (DBH). In northern Idaho, 17 inches is the minimum DBH for old growth subalpine fir and 13 inches is the minimum DBH for old growth lodgepole pine (Green et al. 1992). We used the 15 inches criteria for denning because a stand dominated by trees of the age and size listed in Green et al. (1992) is generally good potential old growth and will likely have the characteristics of lynx denning habitat.

Denning habitat is generally abundant across the coniferous forest landscape and den sites are not likely to be limiting (U.S. Department of Agriculture 2007d, Squires et al. 2008). For this reason, some forests are not delineating denning habitat in remapping efforts. However, maintaining high quality and good distributions of denning habitat within a lynx analysis unit helps to assure survival and reproduction by adult females. To have the option of assessing potential denning habitat and changes based on management, in order to inform management, we included the denning category in this remapping effort.

Currently Unsuitable

Forest stands that are in early stand initiation structural stage do not provide forage and cover for snowshoe hares in the winter and, therefore, do not provide winter foraging habitat for Canada lynx (Ruediger et al. 2000b, Squires et al. 2010, Interagency Lynx Biology Team 2013, Squires 2013). Stands in the initiation structural stage are short enough to be covered by snow in the winter and do not provide cover and foraging for snowshoe hare in the winter (Hodges 1999, Lewis et al. 2011).

Stand-replacing wildfires and regeneration timber harvest create stands that are unsuitable for snowshoe hares and lynx until the stand grows beyond the stem exclusion stage. The number of years after a severe burn or regeneration harvest before a stand has the horizontal stand structure required to support snowshoe hare and lynx depends greatly on the degree of disturbance, stand ecology, local climate, and topography. Therefore, it is difficult to predict an average time a stand grows before it surpasses the stem exclusion stage across the Forests (M. Bienkowski pers. comm.). We estimated 25 years based on a recent forest vegetation simulation analysis by M. Bienkowski (pers. comm.) near Powell, ID. This was consistent with what the Nez Perce National Forest and similar to what the Clearwater National Forest used in previous lynx mapping. We used forestry and fire severity data by year to determine which stands were in unsuitable condition because of stand age and classified those as currently unsuitable.

We would have liked to run a forest vegetation simulation model on representative stands within each lynx analysis unit to determine the age at which a stand grows beyond the stem exclusion stage (as suggested by M. Bienkowski) but did not have the time. We plan to complete this in the near future to further refine the currently unsuitable habitat for the Nez Perce–Clearwater National Forests lynx habitat map.

Lynx Analysis Units

The Lynx Conservation Assessment Strategy recommended that Lynx Analysis Units (LAUs) be identified for all areas with lynx habitat in order to provide an area to monitor habitat changes and the effects of management on individual lynx (Ruediger et al. 2000a). Lynx analysis units are intended to approximate an area needed to support a female lynx year-round and should have sufficient primary vegetation in condition that is suitable for survival and reproduction (Ruediger et al. 2000a, U.S. Department of Agriculture 2007d). Lynx analysis units should be approximately 16,000 to 32,000 acres but may be larger in less continuous, fragmented habitat (Ruediger et al. 2000). At least 6,400 acres (10 miles2) of primary habitat are necessary within each lynx analysis unit, which is the estimated amount of habitat needed to support a female lynx all year (Interagency Lynx Biology Team 2013). Existing ecological units, such as watersheds (6th hydrologic unit codes (HUCs)), are to be used as the basis for mapping lynx analysis units except for the following situations: (a) when HUCs with only small patches of habitat are beyond the daily movement distance of a lynx, the lynx analysis unit can be discarded (Interagency Lynx Biology Team 2013); or (b) HUCs with insufficient amounts of lynx primary habitat can be combined among neighboring lynx analysis units (Ruediger 2000). (Ruediger et al. 2000a)

Once we mapped primary habitat, we mapped new lynx analysis units for the Nez Perce–Clearwater National Forests. Watersheds (HUCs) were the basis for delineating the lynx analysis units. We mapped primary habitat and used the calculated area of primary habitat within each HUC to determine if it contained sufficient habitat to support a lynx. Where there were HUCs that did not contain sufficient habitat, adjacent HUCs were either combined in full or portions of those were appended to neighboring HUCs. When combining portions of neighboring HUCs, we attempted to consolidate habitat in a way that best represented a potential lynx home range. When drawing lynx analysis unit boundaries that did not follow HUC boundaries, we preferred to follow geographic features such as streams or ridges. In some areas, consolidated habitat was not bounded by a geographic feature to follow; and in these cases, we buffered the primary habitat by 200 meters and drew the lynx analysis unit boundary on or near to the buffer edge (figure 65 and figure 66).

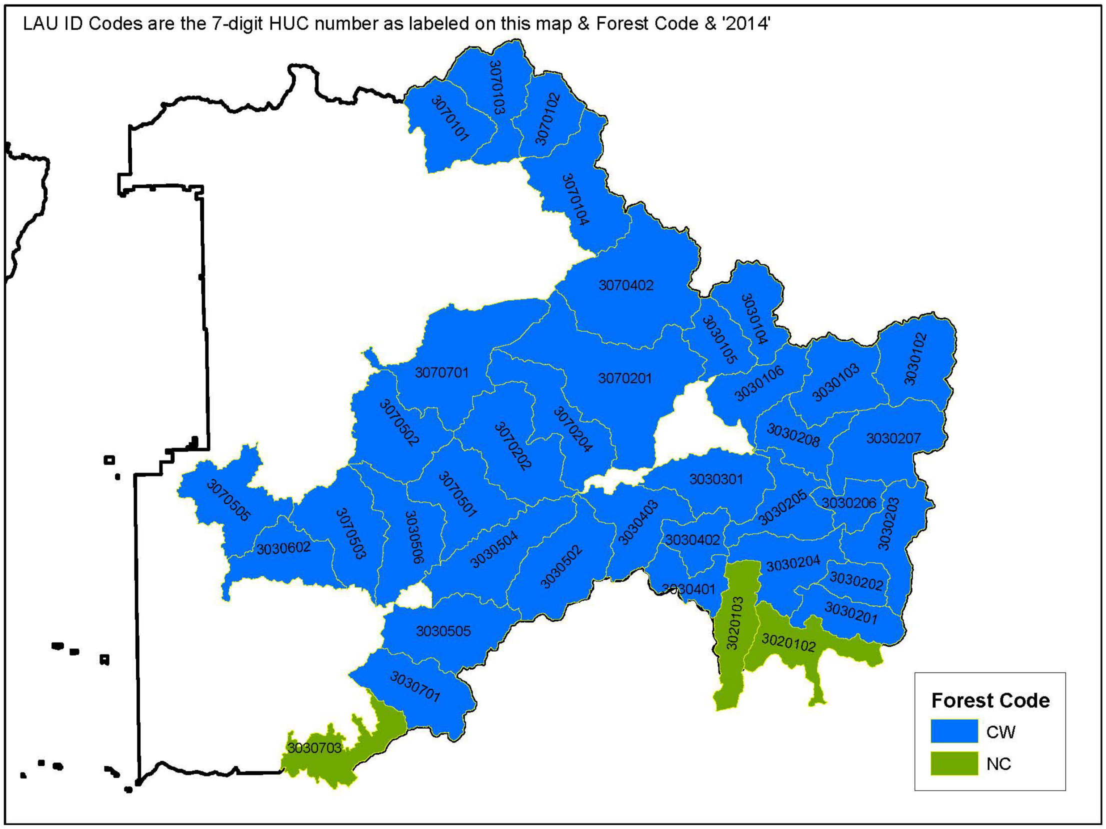

Figure 65. Lynx Analysis Unit Identification (LAU ID) codes for the Clearwater National Forest portion of the Nez Perce–Clearwater National Forests

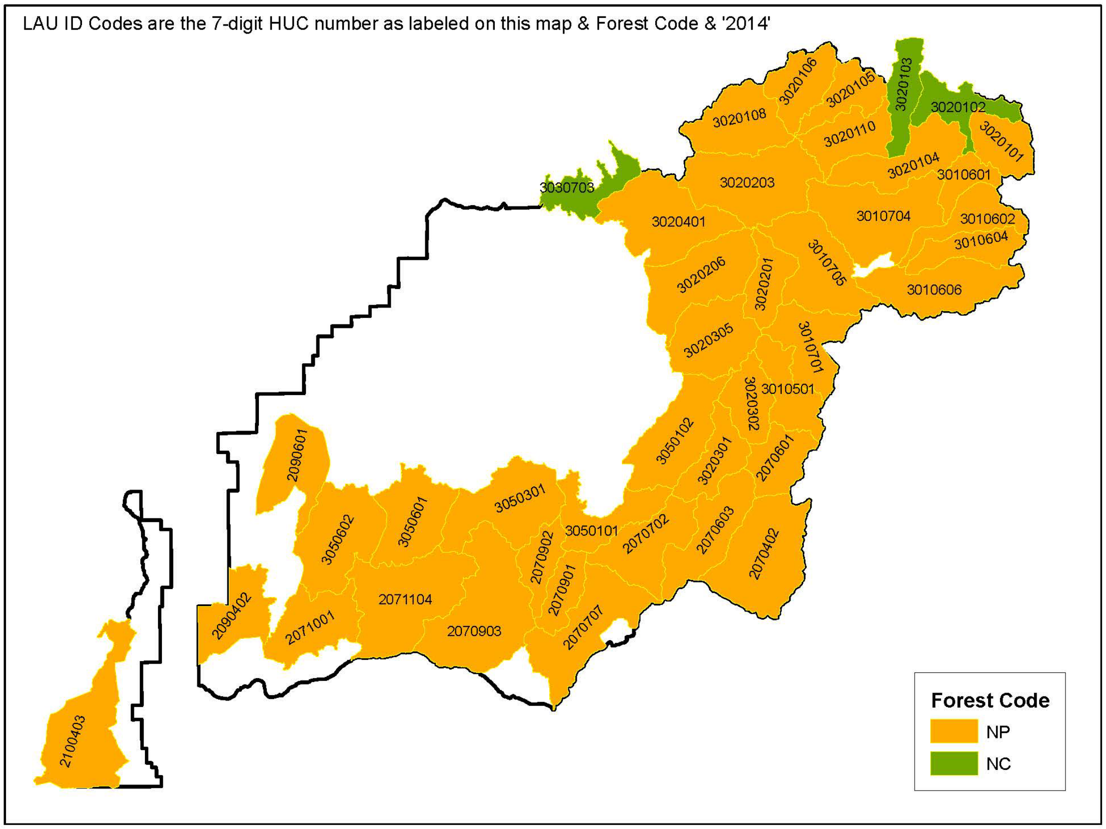

Figure 66. Lynx Analysis Unit Identification (LAU ID) codes for the Nez Perce National Forest portion of the Nez Perce–Clearwater National Forests

Mapping Process/Steps

See Table 170 for a summary of all GIS datasets used in the mapping process, including full name, acronym, data type, file name, and file pathway for storage location on the T-drive or (in the case of PVT) location to download data on the Web. All GIS processing was done by Kathy Brodhead, wildlife biologist, USFS Region 1, Nez Perce–Clearwater National Forests.

Potential Lynx Habitat

- Reproject Potential Vegetation Type layer for Region 1 to NAD83 zone 11 and clip to the forest boundary buffered by 1 km.

  Reclassify PVT to potential habitat raster.

  Reclassify classes: abla1, abla2, abla3, abla4, picea, and pico to 1.

  Reclassify classes: abgr2, abgr3, thpl2, tshe, tsme1, tsme2, and tsme3 to 2.

  Reclassify psme2 to 3.

  Reclassify all other classes 'NoData'.
- Convert the reclassified raster to polygon feature class (uncheck 'simplify polygons' box).
- Select grid_code = 1, export to new feature class: primary.

- Select grid_code = 2, export to new feature class: second_1_nopsme.
- Select grid_code = 3, export to new feature class: psme2_1.
- Reclassify 10-meter DEM to three classes: <4,000 ft., 4,000–7,000 ft., >7,000 ft (<1219 m, 1219–2134 m, >2134 m) and convert to polygon feature class with one feature for each elevational band: elev_4to7k.
- Clip psme2 (1) to elevation features above 4,000 ft and then (2) to the CWNF boundary.
- Merge clipped psme2 and second_1_nopsme: second_2_merged.
- Add short integer field habTyp to attribute table of all feature classes and calculate HabTyp = 1 for primary, HabTyp = 2 for secondary.
- Buffer primary habitat by 200 m and clip secondary to the buffer: second_3_clip.
- Dissolve secondary habitat based on habTyp but do not allow the creation of multipart features so that all contiguous habitat is one polygon feature, but spatially distinct habitat clumps are separate features: second_4_dissv.
- Use select by location to select secondary habitat that is not adjacent to primary habitat (select features that share boundary, switch selection) and delete selected features.
- Merge primary and secondary: potentialhab.
- Delete potential habitat >7,000 ft.
- Add ownership information to potential habitat. Add field text field to NFOwner and calculate = "nf" where owner is clw, nez, or nfsl; = "pvt" where owner is timber company or private; all others = CODE. Dissolve on owner: landowner. Intersect potential habitat and landowner: potentialhab_1_allowners.
- Export potential habitat on federal land: potentialhab_2_fed_own.

Denning

- Select vmap polygons where canopy cover is greater than 40 percent and where DBH >= 15 for all species. Export to new layer and clip to potentialhab_2_fedOwn: vmap_denning.
- Denning combined with potential habitat (see Final Model below).

Currently Unsuitable

- The forest's Activity Polygons were related to the Activity Tables (NEZ_ACTV160_2014_02_25 & CLW_ACTV160_2014_02_25). Polygons were selected with Activity Codes =4100 to 4199 and date > 02/1989 and exported to new feature classes (a_nez_regen_p021989 and b_clw_rengen_p021989).
- High severity fires in year > 1988 were selected from Fire Severity by Year (c_sevrfire_p1988).
- Merge three above feature classes (d_RegenNFire_merged) and then clip to potentialhab_2_fedown (e_RegenNFire_inLynxhab).

Final Model

- Combine potential habitat, denning, and currently unsuitable by union. Add short integer field 'denning' and set = 1 where habitat is denning all others = 0. Add text field 'status' and set = 'cus' where currently unsuitable; all others = 'suitable'. Add Lynx_Hab field and set = 'cus' when status = 'cus', set = 'den' when status = 'suitable' and denning = 1, all others = 'genhab'. This feature class is named LynxHabitat_1_noLAU_allDen and can be used if there is a need to find out if currently unsuitable habitat is denning or general habitat.

- Dissolve on LynxHab but uncheck allow multipart features: LynxHabitat_2_noLAU. Add double field, 'acres' and calculate acres. Change denning habitat where < 5 acres of contiguous denning habitat to 'genhab'.
- Dissolve on LynxHab but keep 'allow multipart features' checked. This feature class is named LynxHabitat_3_dissv and has three features – one for each type of habitat.
- Intersect LAUs and LynxHabitat_3_dssv: LynxHabitat_4_byLAU. Add 'acres' field and calculate acres.
- Add the following fields to LAU_NPCW_2014 layer: acreGenHab, acreDen, acreCUS, acreTotHab. One at a time, for each habitat type (cus, genhab, den), do a definition query on LynxHabitat_4_byLAU (e.g., LynxHab = 'genhab'), join the table to LAU table by HUC ID, calculate appropriate acre field using Lynx Habitat layer acre (e.g., acreGenHab), remove join, and repeat until all three fields are calculated. Calculate acreTotHab = acreGenHab + acreDen + acreCUS

Table 166. Summary of Vegetation Response Units (VRU) on the Nez Perce National Forest and Land Type Association Groups on the Clearwater National Forest

System	Description	Habitat Type Groups	Forest Cover Type
VRU 1	Convex slopes, ABLA	9, 7, 3, 4	ABLA, ABGR, PICO
VRU 2	Glaciated slopes, ABLA	9, 7, 10, 11	ABLA, PIAL, PICO, PIEN
VRU 5	Moraines, ABLA & ABGR	9, 7, 8	PICO, PIEN, PIAL
VRU 6	Cold basins, ABGR & ABLA	3, 4, 9, 7, 8	ABGR, ABLA
VRU 9	High elevation ridges, ABLA & PIAL	9, 10, 11, 7	ABLA, PIAL
VRU 10	Uplands, alder, ABGR & ABLA	4, 5, 7, 8	ABGR, ABLA, TSME
LTA G2	High elevation stream bottoms and glacial terraces	7, 8, 9	ABLA, PIEN, PICO
LTA G6	Alpine glaciated ridges	7, 8, 9, 10, 11	ABLA, PIEN, PICO, PIAL, TSME
LTA G7	Scoured alpine glaciated troughs	9, 10, 11	PICO, ABLA, PIAL, TSHE, PSME
LTA G8	Plastered alpine glaciated troughs	7, 8	ABLA, PIEN, TSME
LTA G9	Alpine icecap uplands and basins	7, 8, 9	ABLA, PIEN, PSME, PICO
LTA G12	High elevation frost churned ridges	10, 11	PIAL, ABLA
LTA G13	Dry frost churned ridges	7, 9, 4, 8, 9	ABLA, PICO, PSME, ABGR
LTA G14	Moist frost churned ridges	7, 4, 5, 8	ABLA, PICO, ABGR, PSME
LTA G16	Low relief rolling hills - umbric or fragipan	5, 4, 6	ABGR, PSME, ABLA

Note: See table 167 for tree species codes listed in Description and Forest Cover Type

Table 167. Potential lynx habitat (primary or secondary), Potential Vegetation Type (PVT) classes that were selected for consideration in mapping potential lynx habitat (see Appendix A), habitat type codes (HT code) and groups (HTG) for the Nez Perce National Forest (see HTG 2005), habitat types (see Cooper et al. 1991), and habitat type group descriptions (see HTG 2005)

Habitat	PVT	HT_code	HTG NPCNF	Habitat Type	HTG Description
primary	abla1	610	8	abla/opho	cool_wet
primary	abla1	630	8	abla/gatr	cool_wet

Habitat	PVT	HT_code	HTG NPCNF	Habitat Type	HTG Description
primary	abla1	635	8	abla/stam	cool_wet
primary	abla1	636	8	abla/stam-mefe	cool_wet
primary	abla1	637	8	abla/stam-lica	cool_wet
primary	abla1	650	8	abla/caca	cool_wet
primary	abla1	651	8	abla/caca-caca	cool_wet
primary	abla1	652	8	abla/caca-lica	cool_wet
primary	abla1	653	8	abla/caca-gatr	cool_wet
primary	abla1	654	8	abla/caca-vaca	cool_wet
primary	abla1	655	8	abla/caca-legl	cool_wet
primary	abla2	620	7	abla/clun	cool_moist
primary	abla2	621	7	abla/clun-clun	cool_moist
primary	abla2	622	7	abla/clun-arnu	cool_moist
primary	abla2	623	7	abla/clun-vaca	cool_moist
primary	abla2	624	7	abla/clun-xete	cool_moist
primary	abla2	625	7	abla/clun-mefe	cool_moist
primary	abla2	660	7	abla/libo	cool_moist
primary	abla2	661	7	abla/libo-libo	cool_moist
primary	abla2	662	7	abla/libo-xete	cool_moist
primary	abla2	663	9	abla/libo-vasc	cool_mod_dry
primary	abla2	671	7	abla/mefe-cooc	cool_moist
primary	abla2	673	7	abla/mefe-xete	cool_moist
primary	abla2	740	7	abla/alsi	cold_mod_dry
primary	abla3	640	9	abla/vaca	cool_mod_dry
primary	abla3	691	9	abla/xete-vagl	cool_mod_dry
primary	abla3	693	9	abla/xete-cooc	cool_mod_dry
primary	abla3	720	9	abla/vagl	cool_mod_dry
primary	abla3	730	10	abla/vasc	cold_mod_dry
primary	abla3	750	9	abla/caru	cool_mod_dry
primary	abla3	770		abla/clps	cool_mod_dry
primary	abla3	780	9	abla/arco	cool_mod_dry
primary	abla3	790	9	abla/cage	cool_mod_dry
primary	abla3	791	9	abla/cage-cage	cool_mod_dry
primary	abla3	792	9	abla/cage-psme	cool_mod_dry
primary	abla4	670	7	abla/mefe	cool_moist
primary	abla4	672	10	abla/mefe-luhi	cool_moist
primary	abla4	674	10	abla/mefe-vasc	cool_moist
primary	abla4	690	9	abla/xete	cool_mod_dry
primary	abla4	692	10	abla/xete-vasc	cool_mod_dry
primary	abla4	694	10	abla/xete-luhi	cool_mod_dry
primary	abla4	731	10	abla/vasc-caru	cool_mod_dry
primary	abla4	732	10	abla/vasc-vasc	cold_mod_dry

Habitat	PVT	HT_code	HTG NPCNF	Habitat Type	HTG Description
primary	abla4	733	10	abla/vasc-thoc	cool_moist
primary	abla4	810		abla/rimo	cool_moist
primary	abla4	830	10	abla/luhi	cold_mod_dry
primary	abla4	831	10	abla/luhi-vasc	cold_mod_dry
primary	abla4	832	10	abla/luhi-mefe	cool_moist
primary	picea	400		picea series	
primary	picea	410	8	picea/eqar	cool_wet
primary	picea	420	7	picea/clun	cool_moist
primary	picea	421	7	picea/clun-vaca	cool_moist
primary	picea	422	7	picea/clun-clun	cool_moist
primary	picea	430		picea/phma	cool_mod_dry
primary	picea	440	8	picea/gatr	cool_wet
primary	picea	450	9	picea/vaca	cool_mod_dry
primary	picea	460	7	picea/sest	mod_cool_moist
primary	picea	461	7	picea/sest-psme	mod_cool_moist
primary	picea	462	7	picea/sest-picea	mod_cool_moist
primary	picea	470	7	picea/libo	cool_moist
primary	picea	480	8	picea/smst	cool_wet
primary	pico	900		pico series	
primary	pico	910	9	pico/putr	cool_mod_dry
primary	pico	920	9	pico/vaca	cool_mod_dry
primary	pico	925	10	pico/xete	cold_mod_dry
primary	pico	930	9	pico/libo	cool_mod_dry
primary	pico	940	10	pico/vasc	cold_mod_dry
primary	pico	950	9	pico/caru	cool_mod_dry
not habitat	abgr1	505	2	abgr/spbe	mod_warm_dry
not habitat	abgr1	506	2	abgr/phma	mod_warm_dry
not habitat	abgr1	507	2	abgr/phma-cooc	mod_warm_dry
not habitat	abgr1	508	2	abgr/phma-phma	mod_warm_dry
secondary	abgr2	510	3	abgr/xete	mod_warm_mod_dry
secondary	abgr2	511	3	abgr/xete-cooc	mod_warm_mod_dry
secondary	abgr2	512	3	abgr/xete-vagl	mod_warm_mod_dry
secondary	abgr2	515	3	abgr/vagl	mod_warm_mod_dry
secondary	abgr2	590	3	abgr/libo	mod_warm_mod_dry
secondary	abgr2	591	3	abgr/libo-libo	mod_warm_mod_dry
secondary	abgr2	592	3	abgr/libo-xete	mod_warm_mod_dry
secondary	abgr3	516	4	abgr/asca	mod_warm_moist
secondary	abgr3	517	4	abgr/asca-asca	mod_warm_moist
secondary	abgr3	518	4	abgr/asca-mefe	mod_warm_moist
secondary	abgr3	519	4	abgr/asca-tabr	mod_warm_moist
secondary	abgr3	520	4	abgr/clun	mod_warm_moist

Habitat	PVT	HT_code	HTG NPCNF	Habitat Type	HTG Description
secondary	abgr3	521	4	abgr/clun-clun	mod_warm_moist
secondary	abgr3	522	4	abgr/clun-arnu	mod_warm_moist
secondary	abgr3	523	3	abgr/clun-xete	mod_warm_mod_dry
secondary	abgr3	524	4	abgr/clun-phma	mod_warm_moist
secondary	abgr3	525	4	abgr/clun-mefe	mod_warm_moist
secondary	abgr3	526	4	abgr/clun-tabr	mod_warm_moist
secondary	abgr3	529	4	abgr/setr	mod_warm_moist
not habitat	psme1	210	1	psme/agsp	warm_dry
not habitat	psme1	220	1	psme/feid	warm_dry
not habitat	psme1	230	1	psme/fesc	warm_dry
not habitat	psme1	380		psme/syor	mod_warm_dry
secondary/not habitat	psme2	250	2	psme/vaca	mod_warm_dry
secondary/not habitat	psme2	260	2	psme/phma	mod_warm_dry
secondary/not habitat	psme2	261	2	psme/phma-phma	mod_warm_dry
secondary/not habitat	psme2	262	2	psme/phma-caru	mod_warm_dry
secondary/not habitat	psme2	263	2	psme/phma-smst	mod_warm_dry
secondary/not habitat	psme2	280	2	psme/vagl	mod_warm_dry
secondary/not habitat	psme2	281	2	psme/vagl-vagl	mod_warm_dry
secondary/not habitat	psme2	282	2	psme/vagl-aruv	mod_warm_dry
secondary/not habitat	psme2	283	2	psme/vagl-xete	mod_warm_dry
secondary/not habitat	psme2	290	3	psme/libo	mod_warm_mod_dry
secondary/not habitat	psme2	291	3	psme/libo-syal	mod_warm_mod_dry
secondary/not habitat	psme2	292	2	psme/libo-caru	mod_warm_dry
secondary/not habitat	psme2	293	3	psme/libo-vagl	mod_warm_mod_dry
secondary/not habitat	psme2	310	2	psme/syal	mod_warm_dry
secondary/not habitat	psme2	311	1	psme/syal-agsp	warm_dry
secondary/not habitat	psme2	312	2	psme/syal-caru	mod_warm_dry
secondary/not habitat	psme2	313	2	psme/syal-syal	mod_warm_dry
not habitat	psme3	320	2	psme/caru	mod_warm_dry
not habitat	psme3	321	1	psme/caru-agsp	warm_dry
not habitat	psme3	322	2	psme/caru-aruv	mod_warm_dry
not habitat	psme3	323	2	psme/caru-caru	mod_warm_dry
not habitat	psme3	324	2	psme/caru-pipo	mod_warm_dry
not habitat	psme3	330	2	psme/cage	mod_warm_dry
not habitat	psme3	340	2	psme/spbe	mod_warm_dry
not habitat	psme3	350	2	psme/aruv	mod_warm_dry
not habitat	psme3	360	2	psme/juco	mod_warm_dry
not habitat	psme3	370	2	psme/arco	mod_warm_dry
not habitat	thpl1	540	6	thpl/atfi	mod_cool_wet
not habitat	thpl1	541	6	thpl/atfi-adpe	mod_cool_wet

Habitat	PVT	HT_code	HTG NPCNF	Habitat Type	HTG Description
not habitat	thpl1	542	6	thpl/atfi-atfi	mod_cool_wet
not habitat	thpl1	550	6	thpl/opho	mod_cool_wet
not habitat	thpl1	555	5	thpl/gydr	mod_cool_moist
not habitat	thpl1	560	6	thpl/adpe	mod_cool_wet
secondary	thpl2	530	5	thpl/clun	mod_cool_moist
secondary	thpl2	531	5	thpl/clun-clun	mod_cool_moist
secondary	thpl2	532	5	thpl/clun-arnu	mod_cool_moist
secondary	thpl2	533	5	thpl/clun-mefe	mod_cool_moist
secondary	thpl2	534	5	thpl/clun-xete	mod_cool_moist
secondary	thpl2	535	5	thpl/clun-tabr	mod_cool_moist
secondary	thpl2	545	5	thpl/asca	mod_cool_moist
secondary	thpl2	546	5	thpl/asca-asca	mod_cool_moist
secondary	thpl2	547	5	thpl/asca-mefe	mod_cool_moist
secondary	thpl2	548	5	thpl/asca-tabr	mod_cool_moist
secondary	tshe	502		tshe series	
secondary	tshe	565	5	tshe/gydr	mod_cool_moist
secondary	tshe	570	5	tshe/clun	mod_cool_moist
secondary	tshe	571	5	tshe/clun-clun	mod_cool_moist
secondary	tshe	572	5	tshe/clun-arnu	mod_cool_moist
secondary	tshe	573	5	tshe/clun-mefe	mod_cool_moist
secondary	tshe	574	5	tshe/clun-xete	mod_cool_moist
secondary	tshe	575	5	tshe/asca	mod_cool_moist
secondary	tshe	576	5	tshe/asca-arnu	mod_cool_moist
secondary	tshe	577	5	tshe/asca-mefe	mod_cool_moist
secondary	tshe	578	5	tshe/asca-asca	mod_cool_moist
secondary	tshe	579	7	tshe/mefe	cool_moist
secondary	tsme1	675	8	tsme/stam	cool_wet
secondary	tsme1	676	10	tsme/stam-luhi	cool_wet
secondary	tsme1	677	8	tsme/stam-mefe	cool_wet
secondary	tsme1	685	7	tsme/clun	cool_moist
secondary	tsme1	686	7	tsme/clun-mefe	cool_moist
secondary	tsme1	687	7	tsme/clun-xete	cool_moist
secondary	tsme2	682	7	tsme/mefe-xete	cool_moist
secondary	tsme2	710	9	tsme/xete	cool_mod_dry
secondary	tsme2	712	9	tsme/xete-vagl	cool_mod_dry
secondary	tsme3	680	7	tsme/mefe	cool_moist
secondary	tsme3	681	10	tsme/mefe-luhi	cool_moist
secondary	tsme3	711	10	tsme/xete-luhi	cool_mod_dry
secondary	tsme3	713	10	tsme/xete-vasc	cool_mod_dry
secondary	tsme3	840	10	tsme/luhi	cold_mod_dry
secondary	tsme3	841	10	tsme/luhi-vasc	cold_mod_dry

Habitat	PVT	HT_code	HTG NPCNF	Habitat Type	HTG Description
secondary	tsme3	842	10	tsme/luhi-mefe	cold_mod_dry

Note: See table 168 for 4-letter tree species codes or see Cooper et al. 1991 or USDA Plants Database online (available at URL: http://plants.usda.gov) for 4-letter understory associate species codes.

Table 168. Tree species and species codes

Scientific Name	Common Name	Species Code
Abies grandis	grand fir	ABGR
Abies lasiocarpa	subalpine fir	ABLA
Pinus albicaulis	whitebark pine	PIAL
Pinus contorta	lodgepole pine	PICO
Picea engelmannii	Englemann spruce	PIEN
Pinus monticoloa	western white pine	PIMO
Pinus ponderosa	ponderosa pine	PIPO
Pseudotsuga menziesii	Douglas-fir	PSME
Taxus brevifolia	Pacific yew	TABR
Thuja plicata	western redcedar	THPL
Tsuga heterophylla	western hemlock	TSHE
Tsuga mertensiana	mountain hemlock	TSME

Table 169. Lynx Analysis Units (LAUs) summary. The number of acres and square miles in each LAU. Acres of general habitat, denning habitat, and forest in Stand Initiation structural stage (currently unsuitable habitat) (CUS). The watershed (HUC12) with the most area in each LAU is listed

LAUID14	Forest	Mile2 LAU	LAU Acres	GenHab Acrea	Den Acres	CUS Acres	TotHab Acres	HU_12_NAME
3020103NC2014	BOTH	33	20935	8935	5940	690	15565	Cedar Creek
3030204CW2014	CLW	38	24497	13066	4827	4831	22724	Lower Big Sand Creek
3030402CW2014	CLW	20	12560	9039	1575	0	10614	Wind Lakes Creek
3030502CW2014	CLW	52	33307	16322	7808	3521	27651	Lake Creek (Lochsa)
3030205CW2014	CLW	35	22561	14426	3540	507	18473	Colt Creek
3030206CW2014	CLW	17	10811	6679	1884	248	8811	Middle Colt Killed Creek
3070204CW2014	CLW	47	30022	15227	5497	82	20806	Middle Cayuse Creek
3030105CW2014	CLW	25	16032	10027	3017	0	13044	Boulder Creek-Crooked Fork Creek
3030104CW2014	CLW	30	19448	14948	1643	858	17449	Upper Crooked Fork Creek
3030701CW2014	CLW	44	28122	12939	3945	0	16884	Old Man Creek
3030505CW2014	CLW	50	32109	17749	6235	0	23984	Boulder Creek
3030202CW2014	CLW	16	10518	1754	3332	2715	7801	Hidden Creek
3030201CW2014	CLW	27	17368	8231	4083	673	12987	Upper Big Sand Creek
3030203CW2014	CLW	39	24758	6326	5352	2922	14600	Upper Colt Killed Creek
3030207CW2014	CLW	51	32708	14916	9742	514	25172	Storm Creek
3030102CW2014	CLW	41	26150	6608	4116	1120	11844	Spruce Creek
3030103CW2014	CLW	40	25841	8789	4951	313	14053	Lower Brushy Fork Creek
3070101CW2014	CLW	37	23476	12441	6132	132	18705	Meadow Creek-CLW
3070402CW2014	CLW	89	56871	31017	5681	3	36701	Upper Kelly Creek
3070102CW2014	CLW	28	17916	14070	3001	94	17165	Long Creek
3070503CW2014	CLW	49	31590	9880	7703	0	17583	Little Weitas Creek
3070501CW2014	CLW	47	29827	15400	2538	55	17993	Upper Weitas Creek
3020301NP2014	NEZ	38	24072	14610	4614	4001	23225	Headwaters Meadow Creek
3050602NP2014	NEZ	75	48303	18451	8817	251	27519	Gospel Creek
3020102NC2014	BOTH	35	22452	6968	5374	474	12816	Upper East Fork Moose Creek
3050101NP2014	NEZ	44	28468	11482	10206	1179	22867	South Fork Red River

LAUID14	Forest	Mile2 LAU	LAU Acres	GenHab Acrea	Den Acres	CUS Acres	TotHab Acres	HU_12_NAME
2070601NP2014	NEZ	36	23084	7233	11448	1695	20376	Upper Bargamin Creek
3010704NP2014	NEZ	87	55666	10718	10052	1147	21917	Pettibone Creek
3020302NP2014	NEZ	35	22353	10867	7119	0	17986	Upper Meadow Creek
3010601NP2014	NEZ	21	13552	6243	2382	104	8729	Wahoo Creek
3010604NP2014	NEZ	33	21329	6091	5421	338	11850	Paradise Creek
3020201NP2014	NEZ	33	20988	6339	6116	0	12455	Marten Creek
2071104NP2014	NEZ	97	62113	10339	2462	899	13700	Sheep Creek
3050301NP2014	NEZ	76	48597	12744	7626	977	21347	Upper Crooked River
3010701NP2014	NEZ	49	31446	7650	8486	1293	17429	Goat Creek
3020305NP2014	NEZ	60	38698	12694	11503	104	24301	Buck Lake Creek
3020206NP2014	NEZ	73	46656	4718	9508	1405	15631	Pinchot Creek-Selway River
3010501NP2014	NEZ	38	24365	7742	10812	83	18637	Upper Running Creek
2070901NP2014	NEZ	27	17450	11602	4191	97	15890	Upper Crooked Creek
3020106NP2014	NEZ	40	25900	15502	6709	144	22355	West Moose Creek
2070902NP2014	NEZ	28	17984	6749	4626	0	11375	Big Creek
2070903NP2014	NEZ	107	68510	8442	4866	2110	15418	Lake Creek (Salmon)
2070702NP2014	NEZ	57	36529	23691	6761	693	31145	Big Mallard Creek
3010606NP2014	NEZ	67	42923	10600	5143	38	15781	Lower Cub Creek
3020101NP2014	NEZ	34	21621	8494	2476	238	11208	Headwaters East Fork Moose Creek
3050601NP2014	NEZ	60	38529	21576	3385	47	25008	Upper Johns Creek
3070103CW2014	CLW	42	26831	17227	8106	8	25341	Vanderbilt Creek- North Fork Clearwater River
3070104CW2014	CLW	54	34393	17598	10565	1264	29427	Lake Creek (N.Fk.Clw)
3070502CW2014	CLW	49	31132	19340	2356	0	21696	Middle Weitas Creek
3030506CW2014	CLW	44	28415	9878	3467	0	13345	Bald Mountain Creek-Lochsa River
3070701CW2014	CLW	74	47337	28368	8071	0	36439	Fourth of July Creek
3030301CW2014	CLW	43	27530	10972	5237	2	16211	Walton Creek-Lochsa River
3030208CW2014	CLW	29	18842	6535	5045	758	12338	Lower Colt Killed Creek
3070202CW2014	CLW	58	36909	19654	7437	535	27626	Gravey Creek

LAUID14	Forest	Mile2 LAU	LAU Acres	GenHab Acrea	Den Acres	CUS Acres	TotHab Acres	HU_12_NAME
2070603NP2014	NEZ	57	36647	10638	7062	312	18012	Lower Bargamin Creek
2070402NP2014	NEZ	89	57001	5349	5434	46	10829	Upper Sabe Creek
3070505CW2014	CLW	45	28685	13933	11263	689	25885	Hemlock Creek
3030602CW2014	CLW	35	22319	6477	8844	1451	16772	Hungery Creek
3030504CW2014	CLW	50	32021	10421	2938	0	13359	Stanley Creek-Lochsa River
3030703NC2014	BOTH	34	21492	13195	4839	0	18034	Fire Creek
3020203NP2014	NEZ	88	56478	11703	11891	317	23911	Three Links Creek
3010705NP2014	NEZ	72	46187	8522	5756	11	14289	Dog Creek-Selway River
3020105NP2014	NEZ	33	21292	13041	3549	193	16783	Upper North Fork Moose Creek
3020110NP2014	NEZ	42	26887	10060	4090	144	14294	Lower East Fork Moose Creek
3020104NP2014	NEZ	56	35689	9904	7698	893	18495	Middle East Fork Moose Creek
3010602NP2014	NEZ	37	23777	8026	3059	69	11154	Upper Bear Creek
3050102NP2014	NEZ	69	44350	7154	16201	571	23926	Upper Red River
2070707NP2014	NEZ	77	49569	12112	10170	1046	23328	Jersey Creek-Salmon River
2071001NP2014	NEZ	55	34901	20806	4045	1008	25859	Meadow Creek-NEZ
2090402NP2014	NEZ	48	30959	6058	6369	188	12615	Fiddle Creek-Salmon River
3020108NP2014	NEZ	57	36396	17898	10705	1279	29882	Rhoda Creek
2100403NP2014	NEZ	88	56224	12717	3457	2349	18523	West Fork Rapid River
3030401CW2014	CLW	22	13786	8173	3078	157	11408	Upper Warm Springs Creek
3020401NP2014	NEZ	82	52602	24014	3215	14	27243	Gedney Creek
2090601NP2014	NEZ	61	39155	10699	12939	1149	24787	South Fork White Bird Creek
3030403CW2014	CLW	40	25444	12848	4903	748	18499	Lower Warm Springs Creek
3030303CW2014	CLW	71	45692	9651	10137	1272	21060	Fishing Creek
3070201CW2014	CLW	78	49676	26418	8761	1330	36509	Upper Cayuse Creek
3030106CW2014	CLW	27	17439	4466	3984	692	9142	Lower Crooked Fork Creek

Table 170. Spatial data layers used for modeling lynx habitat and creating Lynx Analysis Units

Spatial Data	Acronym	File Type	File Name	File Location
Potential Vegetation Types (PVT) Region 1 Classification of Western Montana and Northern Idaho	PVT	raster	zipped file on web	http://www.fs.usda.gov/detail/r1/landmanagement/gis/?cid=fsp5_030918
Administrative ownership	Ownership	feature class	Basic_Ownership_2013_11_05	T:\FS\NFS\NezPerceClearwater\Project\MultiBasin\Planning\NezClwFPR2012 \GIS\Data\Master_gdb\NezClwFPR2012.gdb\Administrative
Activity Polygon - Nez Perce	FACTS	feature class	NEZ_ActivityPolygon	T:\FS\NFS\NezPerceClearwater\Project\MultiBasin\Planning\NezClwFPR2012 \GIS\Data\Resource_Specific\Vegetation\Activities\FACTS.gdb
Activity Polygon - Clearwater	FACTS	feature class	CLW_ActivityPolygon	T:\FS\NFS\NezPerceClearwater\Project\MultiBasin\Planning\NezClwFPR2012 \GIS\Data\Resource_Specific\Vegetation\Activities\FACTS.gdb
Forest activity tables - NPNF	Activity Tables	table	NEZ_ACTV160_2014_02_25	T:\FS\NFS\NezPerceClearwater\Project\MultiBasin\Planning\NezClwFPR2012 \GIS\Data\Resource_Specific\Vegetation\Activities\FACTS.gdb
Forest activity tables - CWNF	Activity Tables	table	CLW_ACTV160_2014_02_25	T:\FS\NFS\NezPerceClearwater\Project\MultiBasin\Planning\NezClwFPR2012 \GIS\Data\Resource_Specific\Vegetation\Activities\FACTS.gdb
Watersheds	HUC12	feature class	HUC12_Watershed_F2F	T:\FS\NFS\NezPerceClearwater\Project\MultiBasin\Planning\NezClwFPR2012 \GIS\Data\Resource_Specific\Hydrology\HUC12_F2F.gdb
Fire Severity by Year	FIRE	feature class	Fire_Severity_by_Year	T:\FS\NFS\NezPerceClearwater\Project\MultiBasin\Planning\NezClwFPR2012 \GIS\Data\Resource_Specific\Fire_Fuels\Fire_History\Fire_Severity.gdb
VMap (existing vegetation)	VMap	feature class	vmap_mid_RA	T:\FS\NFS\NezPerceClearwater\Project\MultiBasin\Planning\NezClwFPR2012 \GIS\Data\Resource_Specific\Vegetation\CLWNEZ_VMap_v12_R1ALB_Rapid.gdb

Appendix J. Objectives, Standards, Guidelines, and Definitions found in the NRLMD Record of Decision

Northern Rockies Lynx Management Direction

All Management Practices And Activities (All)

The following objectives, standards and guidelines apply to management projects in lynx habitat in lynx analysis units (LAU) in occupied habitat and in linkage areas, subject to valid existing rights. They do not apply to wildfire suppression, or to wildland fire use.

Objective ALL O1

Maintain[26] or restore[40] lynx habitat[23] connectivity[16] in and between LAUs[21], and in linkage areas[22].

Standard44 ALL S1

New or expanded permanent development[33] and vegetation management[49] projects[36] must maintain[26] habitat connectivity[16] in an LAU[21] and/or linkage area[22].

Guideline15 ALL G1

Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways[18] or forest highways[12] across federal land. Methods could include fencing, underpasses, or overpasses.

Standard LAU S1

Changes in LAU[21] boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.

Vegetation Management Activities And Practices (Veg)

The following objectives, standards and guidelines apply to vegetation management projects[36] in lynx habitat in lynx analysis units (LAUs) in occupied habitat. With the exception of Objective VEG O3 that specifically concerns wildland fire use, the objectives, standards, and guidelines do not apply to wildfire suppression, wildland fire use, or removal of vegetation for permanent developments such as mineral operations, ski runs, roads and the like. None of the objectives, standards, or guidelines apply to linkage areas.

Objective VEG O1

Manage vegetation[49] to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.

Objective VEG O2

Provide a mosaic of habitat conditions through time that support dense horizontal cover[19], and high densities of snowshoe hare. Provide winter snowshoe hare habitat[51] in both the stand initiation structural stage and in mature, multi-story conifer vegetation.

Objective VEG O3

Conduct fire use[11] activities to restore[40] ecological processes and maintain or improve lynx habitat.

Objective Veg O4

Focus vegetation management[49] in areas that have potential to improve winter snowshoe hare habitat[51] but presently have poorly developed understories that lack dense horizontal cover.

Standard VEG S1

Standard VEG S1 applies to all vegetation management[49] projects[36] that regenerate[38] forests, except for fuel treatment[13] projects[36] within the wildland urban interface[50] (WUI) as defined by HFRA[17], subject to the following limitation:

Fuel treatment projects[36] within the WUI[50] that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). In addition, fuel treatment projects may not result in more than three adjacent LAUs exceeding the standard.

For fuel treatment projects[36] within the WUI50 see guideline VEG G10.

The Standard: Unless a broad scale assessment has been completed that substantiates different historic levels of stand initiation structural stages[45] limit disturbance in each LAU as follows:

If more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects[36].

Standard VEG S2

Standard VEG S2 applies to all timber management[47] projects[36] that regenerate[38] forests, except for fuel treatment[13] projects[36] within the wildland urban interface (WUI)[49] as defined by HFRA[17], subject to the following limitation:

Fuel treatment projects[36] within the WUI[50] that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest).

For fuel treatment projects[36] within the WUI[50] see guideline VEG G10.

The Standard: Timber management[47] projects[36] shall not regenerate[38] more than 15 percent of lynx habitat on National Forest System lands in an LAU in a ten-year period.

Standard VEG S5

Standard VEG S5 applies to all precommercial thinning[35] projects[36], except for fuel treatment[13] projects[36] that use precommercial thinning as a tool within the wildland urban interface[50] (WUI) as defined by HFRA[17], subject to the following limitation:

Fuel treatment projects[36] within the WUI[50] that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest).

For fuel treatment projects[36] within the WUI[50] see guideline VEG G10.

The Standard: Precommercial thinning projects[36] that reduce snowshoe hare habitat, may occur from the stand initiation structural stage[45] until the stands no longer provide winter snowshoe hare habitat only:

Within 200 feet of administrative sites, dwellings, or outbuildings; or

For research studies[39] or genetic tree tests evaluating genetically improved reforestation stock; or

Based on new information that is peer reviewed and accepted by the regional level of the Forest Service, and the state level of Fish and Wildlife Service, where a written determination states:

> that a project[36] is **Not Likely to Adversely Affect** lynx; or
>
> that a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat; or

For conifer removal in aspen, or daylight thinning[5] around individual aspen trees, where aspen is in decline; or

For daylight thinning of planted rust-resistant white pine where 80 percent of the winter snowshoe hare habitat[51] is retained; or

To restore whitebark pine.

Standard VEG S6

Standard VEG S6 applies to all vegetation management[48] projects[36], except for fuel treatment[13] projects[36] within the wildland urban interface (WUI)[50] as defined by HFRA[17], subject to the following limitation:

Fuel treatment projects[36] within the WUI[50] that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest).

For fuel treatment projects[36] within the WUI50 see guideline VEG G10.

The Standard: Vegetation management projects36 that reduce snowshoe hare habitat in multi-story mature or late successional forests[29] may occur only:

Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or

For research studies[39] or genetic tree tests evaluating genetically improved reforestation stock; or

For incidental removal during salvage harvest[42] (e.g., removal due to location of skid trails).

Exceptions 2 and 3 shall only be utilized in LAUs where Standard VEG S1 is met.

(NOTE: Timber harvest is allowed in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover [e.g., uneven age management systems could be used to create openings where there is little understory so that new forage can grow]).

Guideline VEG G1

Vegetation management49 projects36 should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority should be given to stem-exclusion, closed-canopy structural stage[46] stands to enhance habitat conditions for lynx or their prey (e.g., mesic, monotypic lodgepole stands).

Winter snowshoe hare habitat[51] should be near denning habitat6.

Guideline VEG G4

Prescribed fire[34] activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.

Guideline VEG G5

Habitat for alternate prey species, primarily red squirrel[37], should be provided in each LAU.

Guideline VEG G10

Fuel treatment projects36 in the WUI 50 as defined by HFRA[17] should be designed considering standards VEG S1, S2, S5, and S6 to promote lynx conservation.

Guideline VEG G11

Denning habitat[6] should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees ("jack-strawed" piles). If denning habitat appears to be lacking in the LAU, then projects[36] should be designed to retain some coarse woody debris[4], piles, or residual trees to provide denning habitat[6] in the future.

LIVESTOCK MANAGEMENT (GRAZ)

The following objectives and guidelines apply to grazing projects in lynx habitat in lynx analysis units (LAU) in occupied habitat. They do not apply to linkage areas.

Objective GRAZ O1

Manage livestock grazing to be compatible with improving or maintaining[26] lynx habitat[23].

Guideline GRAZ G1

In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating.

Guideline GRAZ G2

In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen.

Guideline GRAZ G3

In riparian areas[41] and willow carrs[3], livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages[28], similar to conditions that would have occurred under historic disturbance regimes.

Guideline GRAZ G4

In shrub-steppe habitats[43], livestock grazing should be managed in the elevation ranges of forested lynx habitat in LAUs[21], to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.

HUMAN USE PROJECTS (HU)

The following objectives and guidelines apply to human use projects, such as special uses (other than grazing), recreation management, roads, highways, and mineral and energy development, in lynx habitat in lynx analysis units (LAU) in occupied habitat, subject to valid existing rights. They do not apply to vegetation management projects or grazing projects directly. They do not apply to linkage areas.

Objective HU O1

Maintain[26] the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat[23].

Objective HU O2

Manage recreational activities to maintain lynx habitat and connectivity[16].

Objective HU O3

Concentrate activities in existing developed areas, rather than developing new areas in lynx habitat.

Objective HU O4

Provide for lynx habitat needs and connectivity when developing new or expanding existing developed recreation[9] sites or ski areas.

Objective HU O5

Manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat.

Objective HU O6

Reduce adverse highway[18] effects on lynx by working cooperatively with other agencies to provide for lynx movement and habitat connectivity16, and to reduce potential of lynx mortality.

Guideline HU G1

When developing or expanding ski areas, provisions should be made for adequately sized inter-trail islands that include coarse woody debris[4], so winter snowshoe hare habitat[51] is maintained.

Guideline HU G2

When developing or expanding ski areas, lynx foraging habitat should be provided consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes.

Guideline HU G3

Recreation developments and operations should be planned in ways that both provide for lynx movement and maintain the effectiveness of lynx habitat[23].

Guideline HU G4

For mineral and energy development sites and facilities, remote monitoring should be encouraged to reduce snow compaction.

Guideline HU G6

Methods to avoid or reduce effects to lynx should be used in lynx habitat[23] when upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development.

Guideline HU G7

New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity[16]. New permanent roads and trails should be situated away from forested stringers.

Guideline HU G8

Cutting brush along low-speed[25], low-traffic-volume roads should be done to the minimum level necessary to provide for public safety.

Guideline HU G9

On new roads built for projects[36], public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives.

LINKAGE AREAS (LINK)

The following objective, standard and guidelines apply to all projects within linkage areas in occupied habitat, subject to valid existing rights.

Objective LINK O1

In areas of intermingled land ownership, work with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential adverse impacts on lynx and lynx habitat.

Standard LINK S1 – Highway or forest highway construction in linkage areas

When highway[18] or forest highway[12] construction or reconstruction is proposed in linkage areas[22], identify potential highway crossings.

Guideline LINK G1 – Land exchanges

National Forest System lands should be retained in public ownership.

Guideline LINK G2 – Livestock grazing in shrub-steppe habitats

Livestock grazing in shrub-steppe habitats[43] should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages[28], similar to conditions that would have occurred under historic disturbance regimes.

Northern Rockies Lynx Management Direction Definitions

[1] *Areas of consistent snow compaction* – An area of consistent snow compaction is an area of land or water that during winter is generally covered with snow and gets enough human use that individual tracks are indistinguishable. In such places, compacted snow is evident most of the time, except immediately after (within 48 hours) snowfall. These can be areas or linear routes, and are generally found in near snowmobile or cross-country ski routes, in adjacent openings, parks and meadows, near ski huts or plowed roads, or in winter parking areas. Areas of consistent snow compaction will be determined based on the area or miles used in 1998 to 2000.

[2] *Broad scale assessment* – A broad scale assessment is a synthesis of current scientific knowledge, including a description of uncertainties and assumptions, to provide an understanding of past and present

conditions and future trends, and a characterization of the ecological, social, and economic components of an area. (LCAS)

[3] *Carr* – Deciduous woodland or shrub land occurring on permanently wet, organic soil. (LCAS)

[4] *Course woody debris* – Any piece(s) of dead woody material, e.g., dead boles, limbs, and large root masses on the ground or in streams. (LCAS)

[5] *Daylight thinning* – Daylight thinning is a form of precommercial thinning that removes the trees and brush inside a given radius around a tree.

[6] *Denning habitat (lynx)* – Denning habitat is the environment lynx use when giving birth and rearing kittens until they are mobile. The most common component is large amounts of coarse woody debris to provide escape and thermal cover for kittens. Denning habitat must be within daily travel distance of winter snowshoe hare habitat – the typical maximum daily distance for females is about three to six miles. Denning habitat includes mature and old growth[24] forests with plenty of coarse woody debris. It can also include young regenerating forests with piles of coarse woody debris, or areas where down trees are jack-strawed.

[7] *Designated over-the-snow routes* – Designated over-the-snow routes are routes managed under permit or agreement or by the agency, where use is encouraged, either by on-the-ground marking or by publication in brochures, recreation opportunity guides or maps (other than travel maps) or in electronic media produced or approved by the agency. The routes identified in outfitter and guide permits are designated by definition; groomed routes also are designated by definition. The determination of baseline snow compaction will be based on the miles of designated over-the-snow routes authorized, promoted or encouraged in 1998 to 2000.

[8] *Designated route* – A designated route is a road or trail that has been identified as open for specified travel use.

[9] *Developed recreation* – Developed recreation requires facilities that result in concentrated use. For example, skiing requires lifts, parking lots, buildings, and roads; campgrounds require roads, picnic tables and toilet facilities.

[10] *Security habitat (lynx)* – Security habitat amounts to places in lynx habitat that provide secure winter bedding sites for lynx in highly disturbed landscapes like ski areas. Security habitat gives lynx the ability to retreat from human disturbance. Forest structures that make human access difficult generally discourage human activity in security habitats. Security habitats are most effective if big enough to provide visual and acoustic insulation and to let lynx easily move away from any intrusion. They must be close to winter snowshoe hare habitat (LCAS).

[11] *Fire use* – Fire use is the combination of wildland fire use and using prescribed fire to meet resource objectives. (NIFC) Wildland fire use is the management of naturally ignited wildland fires to accomplish resource management objectives in areas that have a fire management plan. The use of the term wildland fire use replaces the term prescribed natural fire (Wildland and Prescribed Fire Management Policy, August 1998).

[12] *Forest highway* – A forest highway is a forest road under the jurisdiction of, and maintained by, a public authority and open to public travel (USC: Title 23, Section 101(a)), designated by an agreement with the Forest Service, state transportation agency and Federal Highway Administration.

[13] *Fuel treatment* – A fuel treatment is a management action that reduces the threat of ignition and fire intensity or rate of spread, or is used to restore fire-adapted ecosystems.

[14] *Goal* – A goal is a broad description of what an agency is trying to achieve, found in a land management plan (LCAS) .

[15] *Guideline* – A guideline is a particular management action that should be used to meet an objective found in a land management plan. The rationale for deviations may be documented, but amending the plan is not required. (LCAS modified)

[16] *Habitat connectivity (lynx)* – Habitat connectivity consists of an adequate amount of vegetation cover arranged in a way that allows lynx to move around. Narrow forested mountain ridges or shrub-steppe plateaus may serve as a link between more extensive areas of lynx habitat; wooded riparian areas may provide travel cover across open valley floors (LCAS).

[17] *HFRA (Healthy Forests Restoration Act)* - Public Law 108-148, passed in December 2003. The HFRA provides statutory processes for hazardous fuel reduction projects on certain types of at-risk National Forest System and Bureau of Land Management 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 (Modified from Forest Service HFRA web site).

[18] *Highway* – The word highway includes all roads that are part of the National Highway System (23 CFR 470.107(b)).

[19] *Horizontal cover* – Horizontal cover is the visual obscurity or cover provided by habitat structures that extend to the ground or snow surface primarily provided by tree stems and tree boughs, but also includes herbaceous vegetation, snow, and landscape topography. Horizontal cover was measured by John Squires et al. (pers. com.) in Northwestern Montana according to the following methodology:

"A canvas cover-board (2 m x 0.5 m) was erected 10 m from plot center in 4 directions (forward track, back track, and at 2, 90° angles) was read to directly measure horizontal cover. The cover board was divided into 4, 0.5 meter blocks and each block was further dividend into quarters. At each reading, technicians estimated horizontal cover by 10 percent class at each of the 4 heights; these 4 estimates were then averaged for an overall estimate of that reading." (According to Squires via pers. com., cover measured during the summer period averaged approximately 65 percent while at den sites it was measured at roughly 85 percent. During the winter period cover was measured at 45 percent while at winter kill sites it was slightly greater than 50 percent.)

[20] *Isolated mountain range* – Isolated mountain ranges are small mountains cut off from other mountains and surrounded by flatlands. On the east side of the Rockies, they are used for analysis instead of sub-basins. Examples are the Little Belts in Montana and the Bighorns in Wyoming.

[21] *LAU (Lynx Analysis Unit)* – An LAU is an area of at least the size used by an individual lynx, from about 25 to 50 square miles (LCAS). An LAU is a unit for which the effects of a project would be analyzed; its boundaries should remain constant.

[22] *Linkage area* – A linkage area provides connectivity between blocks of lynx habitat. Linkage areas occur both within and between geographic areas, where basins, valleys or agricultural lands separate blocks of lynx habitat, or where lynx habitat naturally narrows between blocks. (LCAS updated definition approved by the Steering Committee 10/23/01)

[23] *Lynx habitat* – Lynx habitat occurs in mesic coniferous forest that experience cold, snowy winters and provide a prey base of snowshoe hare. In the northern Rockies, lynx habitat is generally occurs between 3,500 and 8,000 feet of elevation, and primarily consists of lodgepole pine, subalpine fir and Engelmann spruce. It may consist of cedar-hemlock in extreme northern Idaho, northeastern Washington and northwestern Montana, or of Douglas fir on moist sites at higher elevations in central Idaho. It may also consist of cool, moist Douglas fir, grand fir, western larch and aspen when interspersed in subalpine forests. Dry forests do not provide lynx habitat. (LCAS)

[24] *Lynx habitat in an unsuitable condition* –Lynx habitat in an unsuitable condition consists of lynx habitat in the stand initiation structural stage where the trees are generally less than ten to 30 years old and have not grown tall enough to protrude above the snow during winter. Stand replacing fire or certain vegetation management projects can create unsuitable conditions. Vegetation management projects that can result in unsuitable habitat include clearcuts and seed tree harvest, and sometimes shelterwood cuts and commercial thinning depending on the resulting stand composition and structure. (LCAS)

[25] *Low-speed, low-traffic-volume road* – Low speed is less than 20 miles per hour; low volume is a seasonal average daily traffic load of less than 100 vehicles per day.

[26] *Maintain* – In the context of this amendment, maintain means to provide enough lynx habitat to conserve lynx. It does not mean to keep the status quo.

[27] *Maintenance level* – Maintenance levels define the level of service provided by and maintenance required for a road. (FSH 7709.58, Sec 12.3). Maintenance level 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most level 4 roads have double lanes and aggregate surfaced. Some may be single lane; some may be paved or have dust abated. Maintenance level 5 is assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-lane and paved, but some may be aggregate surfaced with the dust abated.

[28] *Mid-seral or later* – Mid-seral is the successional stage in a plant community that's the midpoint as it moves from bare ground to climax. For riparian areas, it means willows or other shrubs have become established. For shrub-steppe areas, it means shrubs associated with climax are present and increasing in density.

[29] *Multi-story mature or late successional forest* – This stage is similar to the *old multistory structural stage (see below)*. However, trees are generally not as old and decaying trees may be somewhat less abundant.

[30] *Objective* – An objective is a statement in a land management plan describing desired resource conditions and intended to promote achieving programmatic goals. (LCAS)

[31] *Old multistory structural stage* – Many age classes and vegetation layers mark the old forest, multistoried stage. It usually contains large old trees. Decaying fallen trees may be present that leave a discontinuous overstory canopy. On cold or moist sites without frequent fires or other disturbance, multi-layer stands with large trees in the uppermost layer develop. (Oliver and Larson, 1996)

[32] *Old growth* – Old growth forests generally contain trees that are large for their species and site, and are sometimes decadent with broken tops. Old growth often contains a variety of tree sizes, large snags and logs, and a developed and often patchy understory.

[33] *Permanent development* – A permanent development is any development that results in a loss of lynx habitat for at least 15 years. Ski trails, parking lots, new permanent roads, structures, campgrounds, and many special use developments would be considered permanent developments.

[34] *Prescribed fire* – A prescribed fire is any fire ignited as a management action to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements met, before ignition. The term replaces management ignited prescribed fire (NWCG).

[35] *Precommercial thinning* – Precommercial thinning is mechanically removing trees to reduce stocking and concentrate growth on the remaining trees, and not resulting in immediate financial return (Dictionary of Forestry).

[36] *Red squirrel habitat* – Red squirrel habitat consists of coniferous forests of seed and cone-producing age that usually contain snags and downed woody debris, generally associated with mature or older forests.

[37]*Regeneration harvest* – The cutting of trees and creating an entire new age class; an even-age harvest. The major methods are clear-cutting, seed tree, shelterwood, and group selective cuts (Helms 1998).

[38] *Research* – Research consists of studies conducted to increase scientific knowledge or technology. For the purposes of Standards VEG S5 and VEG S6, research applies to studies financed from the forest research budget (FSM 4040) and administrative studies financed from the national forest budget.

[39] *Restore, restoration* – To restore is to return or re-establish ecosystems or habitats to their original structure and species composition (Dictionary of Forestry).

[40] *Riparian area* – An area with distinctive soil and vegetation between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation (LCAS).

[41] *Salvage harvest* – Salvage harvest is a commercial timber sale of dead, damaged, or dying trees. It recovers economic value that would otherwise be lost. Collecting firewood for personal use is not considered salvage harvest.

[42] *Shrub steppe habitat* – Shrub steppe habitat consists of dry sites with shrubs and grasslands intermingled.

[43] *Standard* – A standard is a required action in a land management plan specifying how to achieve an objective or under what circumstances to refrain from taking action. A plan must be amended to deviate from a standard.

[44] *Stand initiation structural stage* – The stand initiation stage generally develops after a stand-replacing disturbance by fire or regeneration timber harvest. A new single-story layer of shrubs, tree seedlings and saplings establish and develop, reoccupying the site. Trees that need full sun are likely to dominate these even-aged stands (Oliver and Larson 1996).

[45] *Stem exclusion structural stage* – In the stem exclusion stage, trees initially grow fast and quickly occupy all of the growing space, creating a closed canopy. Because the trees are tall, little light reaches the forest floor so understory plants (including smaller trees) are shaded and grow more slowly. Species that need full sunlight usually die; shrubs and herbs may become dormant. New trees are precluded by a lack of sunlight or moisture (Oliver and Larson 1996).

[46] *Timber management* – Timber management consists of growing, tending, commercially harvesting and regenerating crops of trees.

[47] *Understory re-initiation structural stage* – In the understory re-initiation stage, a new age class of trees gets established after overstory trees begin to die, are removed or no longer fully occupy their growing space after tall trees abrade each other in the wind. Understory seedlings then re-grow and the trees begin to stratify into vertical layers. A low to moderately dense uneven-aged overstory develops, with some small shade-tolerant trees in the understory (Oliver and Larson 1996).

[48] *Vegetation management projects* – Vegetation management projects change the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire and timber harvest. For the purposes of this amendment, the term does not include removing vegetation for permanent developments like mineral operations, ski runs, roads and the like, and does not apply to fire suppression or to wildland fire use.

[49] *Wildland urban interface (WUI)* - The area adjacent to an at-risk community that is identified in the community wildfire protection plan. If there is no community wildfire protection plan in place, the WUI is the area 0.5 mile from the boundary of an at-risk community or within 1.5 miles of the boundary of an at-risk community. The WUI could also include areas if the terrain is steep, or there is a nearby road or ridge top that could be incorporated into a fuel break, or the land is in condition class 3, or the area contains an emergency exit route needed for safe evacuations. (Condensed from HFRA. For full text see HFRA § 101.)

[50] *Winter snowshoe hare habitat* – Winter snowshoe hare habitat consists of places where young trees or shrubs grow dense – thousands of woody stems per acre – and tall enough to protrude above the snow during winter, so hares can browse on the bark and small twigs (Ruediger et al. 2000). Winter snowshoe hare habitat develops primarily in the stand initiation, understory re-initiation and old forest multistoried structural stage.

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