Biological Assessment for Threatened, Endangered, and Proposed Terrestrial Wildlife Species

2020 Forest Plan for the Helena-Lewis and Clark National Forest

Prepared by:

/s/ *Wendy E. Clark*	03/13/2020
Wendy E. Clark, Wildlife Biologist	Date
/s/ *David B. Kemp*	03/13/2020
David B. Kemp, Wildlife Biologist	Date

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List of Terms and Abbreviations

Terms used in this document

Term	Full name/additional information
the Forest	Helena-Lewis and Clark National Forest
the Service	U.S. Fish and Wildlife Service
grizzly bear amendment(s)	Forest Plan Amendments to incorporate relevant direction from the Northern Continental Divide Ecosystem Draft Grizzly Bear Conservation Strategy
the assessment	Assessment of the Helena-Lewis and Clark National Forest
forest plan	Helena-Lewis and Clark National Forest Revised Land Management Plan
Helena forest plan	Helena National Forest Land and Resource Management Plan (1986)
Lewis and Clark forest plan	Lewis and Clark National Forest Land and Resource Management Plan (1986)
the Rule	the 2012 Planning Rule as described in 36 CFR Part 219, Subpart A

Abbreviations used in this document

Abbreviation	Full term/description
BA	biological assessment
BASI	best available scientific information
BMU	Bear management unit
BO	biological opinion
CDNST	Continental Divide National Scenic Trail
CFR	Code of Federal Regulations
CMA	Conservation management area
dbh	diameter at breast height
DC	desired condition (reference to forest plan component)
DPS	distinct population segment
EIS	environmental impact statement (DEIS = draft EIS; FEIS = final EIS)
ESA	Endangered Species Act
ESI	early stand initiation
FS	Forest Service
FW	forestwide (reference to forest plan component)
GA	Geographic Area
GBCS	Grizzly Bear Conservation Strategy
GDL	guideline (reference to forest plan component)
GIS	geographic information system
GO	goal (reference to forest plan component)
GYE	greater Yellowstone ecosystem
HLC NF	Helena-Lewis and Clark National Forest
HNF	Helena National Forest
HUC	hydrologic unit code

Abbreviation	Full term/description
IGBC	interagency grizzly bear committee
INFISH	Inland Native Fish Strategy
IRA	Inventoried roadless area
ITS	Incidental take statement
LAU	Lynx analysis unit
LCAS	Lynx Conservation Assessment Strategy
LCNF	Lewis and Clark National Forest
MA	management area
mmbf	million board feet
mmcf	million cubic feet
MFWP	Montana Fish, Wildlife and Parks
NCDE	Northern Continental Divide Ecosystem
NEPA	National Environmental Policy Act
NF	National Forest
NFS	National Forest System
NRLMD	Northern Rockies Lynx Management Direction
NRV	natural range of variation
OBJ	objective (reference to forest plan component)
OMRD	open motorized route density
PACFISH	Pacific Fish Strategy
PCA	primary conservation area
PCE	primary constituent element
PIBO	PACFISH/INFISH Biological Opinion
PVT	potential vegetation type
RMO	riparian management objective
RMZ	riparian management zone
ROD	record of decision
ROS	recreation opportunity spectrum
RWA	recommended wilderness area
SCC	species of conservation concern
STD	standard (reference to forest plan component)
SUIT	suitability (reference to forest plan component)
TMDL	total maximum daily load
TMRD	total motorized road density
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WSA	wilderness study area
WUI	wildland urban interface

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Introduction

Threatened, endangered, and proposed species are managed under the authority of the Federal Endangered Species Act (PL 93-205, as amended) and the National Forest Management Act (PL-940588). Under provisions of the Endangered Species Act (ESA), federal agencies shall use their authorities to carry out programs for the conservation of listed species, and shall ensure that any action authorized, funded, or implemented by a federal agency is not likely to (1) adversely affect listed species or designated critical habitat, (2) jeopardize the continued existence of a proposed species, or (3) adversely modify proposed critical habitat (16 USC 1536).

The purpose of this programmatic biological assessment (BA) is to analyze the potential impacts of implementing a framework programmatic action, the proposed Land and Resource Management Plan (hereafter referred to as the "Forest Plan" or "the 2020 Forest Plan") for the Helena-Lewis and Clark National Forest (HLC NF), in sufficient detail to determine the extent to which implementation of the 2020 Forest Plan, Alternative F, may affect any of the threatened, endangered, proposed, or candidate species listed below or their designated or proposed critical habitats. This BA is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act ((ESA); 16 U.S.C. 1536 (c)), and follows the standards established in the Forest Service's National Environmental Policy Act (NEPA) and ESA guidance. The proposed action is a framework programmatic action that does not approve or authorize specific actions or activities, but instead guides development of future actions that will be authorized, funded, and carried out at a later time. As such, direct effects to listed species are expected occur only at such time as future actions are authorized, funded, or carried out subject to future section 7 consultation.

This document includes a description of the proposed federal action, and the biological assessments for federally listed and proposed terrestrial wildlife species (Canada lynx, grizzly bear, and wolverine). Biological assessments for the listed aquatic species (bull trout) and candidate botanical species (whitebark pine) are provided under separate cover as part of the complete consultation package for the proposed federal action.

Federally designated species and designated critical habitat

In accordance with section 7(c) of the ESA, the U.S. Fish and Wildlife Service (USFWS) has determined that the following federally designated species may be present on the HLC NF as of 12 December 2019, per the list posted at https://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species/Forests/Helena-L&C_sp_list.pdf as checked on 13 January 2020 (Table 1).

Table 1. Federally designated species on the HLC NF

Common Name	Scientific Name	Status[1]	Distribution in Planning Area
Bull trout	*Salvelinus confluentus*	Threatened; critical habitat	West of the Continental Divide (Upper Blackfoot and portion of Divide geographic areas only) in cold water streams, rivers, and lakes.
Canada lynx	*Lynx Canadensis*	Threatened; critical habitat	Resident in core lynx habitat (montane spruce/fir forests of western Montana, including the Rocky Mountain Range, Upper Blackfoot, and north portion of Divide GAs. Transient in secondary/peripheral lynx habitat, (south portion of Divide Geographic Area and other geographic areas not listed above). Critical habitat area corresponds with area where lynx are identified as resident (core habitat).

Common Name	Scientific Name	Status[1]	Distribution in Planning Area
Grizzly bear	*Ursus arctos*	Threatened	Resident or transient in all parts of HLC NF except the Snowies, Crazies, and Castles GAs and the portion of the Big Belts GA south of U.S. Highway 12[2]. Alpine/subalpine coniferous forests of primarily western Montana, increasingly also lower elevation riparian and prairie east of the Continental Divide.
Wolverine	*Gulo luscus*	Proposed	Throughout the HLC NF. High elevation alpine and boreal forests that are cold and receive enough winter precipitation to reliably maintain deep persistent snow late into the warm season.
Whitebark pine	*Pinus albicaulis*	Candidate	Throughout the HLC NF. Forested areas in western and central Montana, in high-elevation, upper montane habitat near treeline.

[1]Status refers to listing designation under the Endangered Species Act
[2]Grizzly bear 'may be present' area described according to USFWS map dated October 2018 (see project file)

Consultation history

In accordance with the Endangered Species Act and its implementing regulations, and with Forest Service Manual direction, the record of consultation for this Forest Plan revision is found in Appendix B. Any prior consultations with relevance to the current consultation are discussed as needed in the species assessments.

Description of the proposed action

The HLC NF is proposing to revise its land and resource management plan (Forest Plan). The 2020 Forest Plan, Alternative F, also referred to in this document as the proposed action, is described in more detail below under the heading "Description of the Preferred Alternative". Specific plan components included in the 2020 Forest Plan are discussed where relevant in the analysis found under the heading "Environmental Consequences". The 2020 Forest Plan is expected to guide management and decision-making on the HLC NF for approximately 15 years after it is completed. The 2020 Forest Plan is a framework programmatic action and does not make commitments nor decisions approving or prohibiting specific actions or activities. Instead, it provides the framework that guides subsequent site-specific planning and decision-making.

Need for and purpose of the proposed action

Need

In 2015, the formerly separate Helena National Forest and Lewis and Clark National Forest were combined administratively to form the HLC NF. Each separate forest had its own forest plan that has continued to direct management on the formerly separate portions of the combined HLC NF. As a result of combining the two forests to be managed as one unit, there is a need to develop a single forest plan for the entire administrative area.

The HNF and LCNF Forest Plans were both completed in 1986, over 30 years ago. Since that time, some conditions of the land and resources have changed, some social, economic, or ecological needs and conditions have changed, and new scientific and other information has become available. There is a need to revise the Forest Plans to consider or incorporate those changes.

In May of 2012 the United States Forest Service (USFS) began using new planning regulations (hereafter referred to as the "2012 Planning Rule" or simply as "the planning rule") to guide collaborative and

science-based revision of Forest Plans. Specific requirements of the 2012 Planning Rule are described below; there is a need to develop and implement a revised Forest Plan for the HLC NF that complies with the direction provided in those regulations.

Purpose

The purpose of this proposed action is to revise and combine the former HNF and LCNF Forest Plans into a single plan for the entire administrative unit, and to incorporate new information, consider changed conditions, and provide integrated direction for social, economic, and ecological sustainability and multiple uses of the HLC NF land and resources in compliance with the 2012 Planning Rule.

The purpose of the 2020 Forest Plan is to set direction for management of NFS lands administered by the HLC NF, based on an integrated evaluation of social, economic, and ecological considerations. This direction is used to guide programs, practices, and uses of HLC NF lands. A Forest Plan is a framework programmatic document that provides broad direction similar to zoning in a community. As such, it does not authorize site-specific prohibitions, actions or activities, all of which will continue to require site-specific analysis and decision-making.

Action area

The action area, also referred to in this document as the "planning area", is the HLC NF which is located in central Montana and includes approximately 2,883,227 acres of public National Forest System (NFS) lands within its administrative boundaries. The plan area also includes slightly more than 30,000 acres of NFS land on the Beaverhead-Deerlodge National Forest administered by the HLC NF, and slightly more than 2,000 acres of NFS lands in isolated parcels outside the administrative boundaries. Inholdings of other ownerships occur within the HLC NF administrative boundaries; those are not included in the total acreages above and are not subject to management by the Forest Service. The HLC NF includes portions of 17 counties and is managed as eight ranger districts: Rocky Mountain, Lincoln, Helena, Townsend, White Sulphur Springs, Belt Creek, Judith, and Musselshell.

The HLC NF straddles the Continental Divide and includes several island mountain ranges. Because of its diversity and extent, and because the island mountain ranges each include unique ecological and social context, the plan area is divided into ten geographic areas (GAs). GAs provide a means for describing conditions and trends at a more local scale than forestwide, where appropriate. Some plan components in the revised plan are unique to individual GAs, reflecting the specific ecological and/or social context of NFS land management there. Table 2 displays the acres of the HLC NF by GA, and Figure 1 displays the GAs in geographic context.

Table 2. Acres within the ten GAs on the HLC NF

Geographic Area	Total Acres (all ownerships)	NFS Acres within GA	% of GA in NFS lands
Big Belts	452,292	312,983	69
Castles	79,862	69,610	87
Crazies	70,036	57,618	82
Divide	232,890	202,577	87
Elkhorns	175,259	160,599	92
Highwoods	44,495	42,315	95
Little Belts	900,961	802,711	89
Rocky Mountain Range	782,986	777,963	99
Snowies	121,897	117,989	98
Upper Blackfoot	348,185	333,215	96

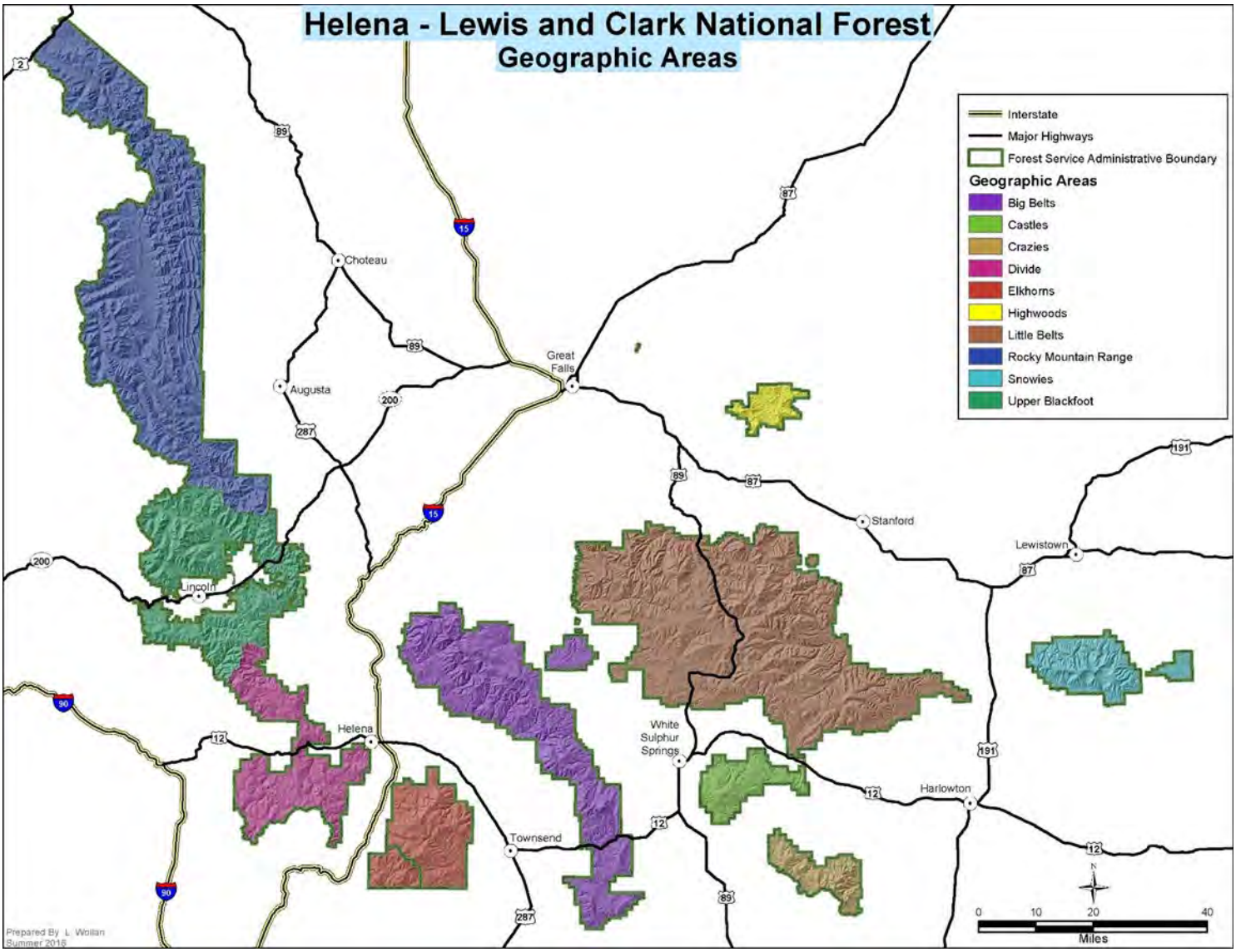

Figure 1. GAs of the HLC NF

Forest planning framework

The proposed action is a framework programmatic action that approves a framework for the development of future actions that will be authorized, funded, or carried out at a later time (50 CFR Part 402 Amended. Federal Register, Vol. 80. No. 90, Monday May 11, 2015. 26832-26845).

The 2012 Planning Rule

The United States Forest Service (USFS) carries out land and resource management planning under regulations referred to as the 2012 Planning Rule, that call for collaborative and science-based revision of Forest Plans. The 2012 Planning Rule requires Forest Plans to include certain types of components (refer to "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 use (36 CFR 219.10), and timber (36 CFR 219.11).

In order to meet the requirements for plant and animal diversity, the rule calls for a complementary ecosystem and species-specific approach to forest management. Plan components must provide for ecosystem integrity and diversity by maintaining or restoring the structure, function, composition, and connectivity of ecosystems, and by maintaining key ecological characteristics (36 CFR 219.9(a)(1) and (2)). If those "coarse filter" components are not sufficient to provide conditions that will 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 (SCC) within the plan area, then additional, species-specific plan components must be included (36 CFR 219.9(b)).

In addition to the above requirements, the 2012 Planning Rule contains several other requirements that shape the Forest Plan and therefore may influence Forest resources, including wildlife and habitats. The rule requires that Forest Plans identify:

- Lands suitable for inclusion in the National Wilderness Preservation System (36 CFR 219.7(c)(2)(v)), and/or rivers eligible for inclusion in the National Wild and Scenic Rivers System (36 CFR 219.7(c)(2)(vi))
- Existing designated areas and any additional areas recommended for designation (36 CFR 219.7(c)(2)(vii)
- Suitability of areas for appropriate integration of resource management and uses, including identifying lands not suitable for timber production (36 CFR 219.7(c)(2)(viii)
- The maximum quantity of timber that may be removed from the plan area (36 CFR 219.7(c)(2)(ix)
- Questions and indicators for monitoring (36 CFR 219.7(c)(2)(x) and the monitoring program itself (36 CFR 219.7(c)(3)(iii)
- Management areas and/or geographic areas (36 CFR 219.7(e))
- Watersheds that are a priority for maintenance or restoration (36 CFR 219.7(f)(i))
- Distinctive roles and contributions of the plan area to the broader landscape (36 CFR 219.7(f)(iii))
- Proposed and possible actions that may occur on the plan area during the life of the plan, including the planned timber sale program, timber harvesting levels, and the proportion of probable methods of vegetation management to be used (36 CFR 219.7(f)(iv))

Plan components

Plan components are specific statements that guide future projects and activities and the monitoring program in the plan area. Plan components may apply to the entire plan area (i.e., the entire HLC NF), or to identified geographic or management areas (36 CFR 219.7(e)). The 2012 Planning Rule requires that Forest Plans include all the following types of components except goals, which are optional.

- **Desired Condition** (DC) - a description of specific social, economic, and/or ecological characteristics 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 not include completion dates (36 CFR 219.7 (e)(1)(i)).
- **Goal** (GO) –a broad statement of intent, other than desired conditions, usually related to process or interaction with the public or other agencies. Goals are expressed in broad, general terms, and do not usually include completion dates (36 CFR 219.7 (e)(2)). Goals may be dependent on conditions beyond the plan area or outside USFS authority.
- **Objective** (OBJ) - a concise, measurable, and time-specific statement of a desired rate of progress toward one or more desired conditions. Objectives should be based on reasonably foreseeable budgets (36 CFR 219.7(e)(1)(ii)) and will occur over the life of the Forest Plan.

- **Standard** (STD) - a mandatory constraint on project and activity decision-making, established to help achieve or maintain one or more desired conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iii)).
- **Guideline** (GDL) - 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 one or more desired conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iii)).
- **Suitability of Lands** (SUIT) - specific lands within the Forest are to be identified as suitable or not suitable for various multiple uses or activities, based on the desired conditions applicable to those lands. The suitability of lands need not be identified for every use or activity (36 CFR 219.7(e)(1)(v)). Identifying suitability does not make a specific commitment to authorize the use(s) identified, but is instead simply an indication that a type of use may be appropriate. Site, project, or activity-specific decision-making procedures must occur before a specific use is authorized in an area.

Monitoring program

The 2012 Planning Rule requires development of a monitoring program to provide feedback for the planning cycle by testing relevant assumptions, tracking relevant conditions over time, and measuring management effectiveness (36 CFR 219.12). The monitoring program includes plan-level and broader-scale monitoring, and biennial monitoring evaluation reports document whether changes to the plan or to the monitoring program is warranted (36 CFR 219.5). The monitoring program can be found as Appendix B of the "2020 Forest Plan for the Helena-Lewis and Clark National Forest" and is not included with this document.

Planning directives

Procedural guidance for implementing the 2012 Planning Rule in revising Forest Plans is found in the Final Land Management Planning Directives (FSH 1909.12 – Land Management Planning Handbook) issued in January 2015. Chapter 20, Section 23 provides considerations and guidance for developing plan components that will provide for ecological sustainability and diversity of plant and animal communities. The planning directives are revised and updated periodically.

Description of the preferred alternative – alternative F

The 2012 Planning Rule anchors Forest Plans in desired conditions that are to be achieved through application of other plan components during forest management activities. The preferred alternative (alternative F) identifies the types of uses and management activities that would be allowed on the HLC NF, by identifying areas such as recommended wilderness areas, special emphasis areas, and other designations where certain uses would be allowed. The preferred alternative also identifies lands suitable or not suitable for specific management activities such as timber production, saleable mineral activities, and others. Table 3 displays the total HLC NF acres on which specific uses would be allowed, and the acres on which those activities are currently allowed under the 1986 Forest Plans, for comparison. In the framework programmatic context of a Forest Plan, acres where activities or uses would be allowed reflect a general designation where that activity or use could potentially be planned and implemented. The location, type, and extent of actual uses or activities is determined by site specific planning and analysis and therefore would occur on a much smaller acreage than that shown in Table 3. Additional details regarding the acreage or amount of activities and uses that would be allowed under the preferred alternative are provided as needed in the individual species assessments.

Table 3. Summary of activities and uses that would be allowed under the preferred alternative (alternative F) compared to the 1986 Forest Plans (alternative A; existing condition)

Type of activity/use	Alternative F		1986 plans	
	Acres	Percent of forest	Acres	Percent of forest
Land suitable for timber production[1]	368,814	13%	414,936	14%
Land unsuitable for timber production but where harvest[2] may occur	1,673,853	58%	1,167,247	40%
Personal use of forest products	2,874,356	100%	2,874,356	100%
Commercial use of forest products	2,037,261	71%	2,092,374	73%
Recommended Wilderness	153,136	5%	34,212	1%
Eligible Wild and Scenic Rivers	361 miles	NA	140 miles	NA
Research Natural Areas	18,447	1%	16,870	1%
Green Timber Botanical Area	1,167	0%	NA	NA
Badger Two Medicine Special Area	129,740	4%	NA	NA
Experimental and demonstration forests	8,871	<1%	8,871	<1%
Recreation Emphasis Areas	89,439	3%	0	NA
Grazing allotments	1,355,143	47%	1,355,143	47%
Riparian Management Zones	496,212	17%	0	NA
Wheeled motorized vehicle use (spring-summer-fall)	1,098,892	38%	1,099,010	38%
Over-snow motorized use (winter)	1,875,187	65%	1,875,187	65%
Summer non-motorized	1,784,322	62%	1,784,204	62%
Winter non-motorized	1,875,187	65%	1,839,900	64%

[1] Timber production is 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).
[2] Timber harvest is the removal of trees for wood fiber use and other multiple-use purposes (36 CFR 219.9)

The 2020 Forest Plan, Alternative F, includes components that guide management of a variety of resources and activities on the HLC NF toward achieving DCs. The 2020 HLC NF plan (proposed action) describes management direction at both the forestwide scale and, where needed, specifically within one or more of ten GAs. The following summary provides an overview of plan direction for several broad resource areas, focusing largely on direction that could impact terrestrial and aquatic wildlife and habitats. For a complete list of goals, desired conditions, objectives, guidelines, and standards in the proposed action, see the 2020 Forest Plan. The direction from the 2020 Forest Plan that is cited in this BA can be found in appendix A.

Aquatic ecosystems

Desired conditions for aquatic ecosystems in the proposed action emphasize maintaining or restoring the distribution, diversity, and resilience of and connectivity among aquatic systems and riparian habitats on the HLC NF. Desired conditions also emphasize maintenance or restoration of natural ranges of flows, flooding, and sediment load. Objectives set specific goals for restoration of watersheds and groundwater-dependent ecosystems and connectivity among them, improvement of soil and hydrologic function, improvement of aquatic habitat. Plan components guide or constrain management activities and uses in riparian and aquatic habitats in order to achieve DCs and to limit or prevent introduction of pollutants, minimize disturbance to in-stream structure and flows, and minimize alterations to riparian habitats.

Fire and fuels management

The proposed action includes DCs that would allow wildland fire to play its natural ecological role as nearly as possible and that wildland fire would be managed where possible to meet resource objectives (FW-FIRE-DC-01). FW-FIRE-DC-02 states that fuel conditions in the wildland-urban interface (WUI) would provide for low-severity surface fire that minimizes threats to values. The DCs would be met in part by achieving a specified amount of hazardous fuels treatments in the wildland-urban interface (FW-FIRE-OBJ-01). Plan components would encourage the use of vegetation treatments to create conditions that allow for naturally ignited fires to occur in a "self-regulating" fashion (FW-FIRE-GDL-01 and 02).

Vegetation

The 2020 Forest Plan establishes desired conditions for vegetation on the HLC NF largely based on broad potential vegetation type. Desired conditions are based on the estimated natural range of variation (NRV) for various cover types, species groups, and forest structural components, and provide for diversity in vegetation composition and structure, resilience after disturbances, and restoration of ecosystem integrity (FW-VEGT-DC-01 and 02 and accompanying Tables 4 and 5 in the 2020 Forest Plan, and FW-VEGF-DC-01 through 08 and accompanying Tables 6 through 13 in the 2020 Forest Plan). Desired conditions also address maintenance or restoration of wildlife habitats (FW-VEGT-DC-03) and emphasize connectivity (FW-VEGT-DC-04) among habitats at varying scales. The plan includes specific objectives (FW-VEGT-OBJ-01) to move vegetation toward desired conditions.

Plan components are included that would minimize the impacts of management actions that could move vegetation away from desired conditions, including limits on removal of native vegetation for certain activities (FW-VEGT-GDL-01), grazing guidance (FW-VEGT-GDL-02), and planting or re-establishing native vegetation (FW-VEGT-GDL-03 and 04). Other plan components address management of specific key habitat elements such as openings (FW-VEGF-DC-08), very large trees (FW-VEGF-GDL-01), snags (FW-VEGF-GDL-02), old growth (FW-VEGF-GDL-04), downed woody debris (FW-VEGF-GDL-05), and non-forested vegetation types (FW-VEGNF-DC 01-03) in order to maintain or move toward desired conditions for each. Most GAs include several vegetation-related desired conditions that are specific to the habitat and vegetation types that occur within that GA. Plan components are included that address conservation and recovery of at-risk plant species, such as whitebark pine (FW-PLANT-DC-01 and 02, FW-PLANT-GO-01, and FW-PLANT-OBJ-01).

Wildlife

The 2020 Forest Plan includes DCs to maintain the vegetation composition, structure, and distribution needed by wildlife for their life history requirements (FW-WL-DC-01 and 02) and for connectivity among habitats and seasonal ranges (FW-WL-DC-03). Desired conditions also direct management to maintain large, unroaded areas to provide for species that require seclusion (FW-WL-DC-04), and to minimize disturbance in key seasonal habitats (FW-WL-DC-06). The revised plan directs managers to work closely with other state and federal wildlife and land management agencies to manage habitats across jurisdictions (FW-WL-GO-01 through 04) and to collaborate on conservation and recovery of federally listed species (FW-WL-GO-05). Plan components in some GAs emphasize specific habitat needs based on species' ranges and call for maintenance or restoration of connectivity for wide-ranging wildlife species.

Plan components specifically addressing management of habitat to conserve and recover Canada lynx and grizzly bear are included through retention of the Northern Rockies Lynx Management Direction (U.S. Department of Agriculture, Forest Service, 2007d) and the Amendments to Incorporate Management Direction in the NCDE Grizzly Bear Conservation Strategy Into Forest Plans (USDA, 2018a). Additional information about each of these is included in the assessments for those species.

Recreation

Direction in the 2020 Forest Plan for managing recreation on the HLC NF is divided into several topics. In addition to those described below, the plan includes guidance for maintaining scenic character (FW-SCENERY-DC-01 through 03 and FW-SCENERY-GDL-01.

Recreation settings

The 2020 Forest Plan, Alternative F, identifies desired Recreation Opportunity Settings (ROS) and includes plan components for each that direct or constrain uses such as motorized access, scenery, and vegetation management to be consistent with each ROS (FW-ROS-DC-01 and associated Table 15 in the 2020 Forest Plan). The amount of each ROS identified in the preferred alternative is shown in Table 4, below. Descriptions of each ROS, along with plan components supporting each, can be found in the 2020 Forest Plan (Glossary).

Table 4. Forestwide ROS Classes in the preferred alternative (alternative F)

ROS classification	Acres - summer	Percent of total NFS lands - summer	Acres-winter	Percent of total NFS lands - winter
Primitive	1,034,673	36%	1,018,346	35%
Semi-primitive non-motorized	749,649	26%	856,841	30%
Semi-primitive motorized	375,866	13%	725,625	25%
Roaded natural	694,044	24%	253,979	9%
Rural	28,982	1%	28,432	1%
Urban	0	NA	0	NA

Recreation opportunities, special uses, and access

The 2020 Forest Plan identifies scales of development associated with recreation sites (Table 16 in the 2020 Forest Plan) and includes DCs to provide a variety of types of recreation opportunities while protecting other resources. The plan includes objectives for removing and rehabilitating recreations sites where resource damage or conflict has occurred (FW-REC-OBJ-01 through 04), and guidelines to manage recreation sites to be responsive to wildlife habitat needs or potential for conflict (FW-REC-GDL-01, FW-REC-GDL-07) and to prevent specific types of resource damage or conflict, with emphasis on riparian and aquatic ecosystems (FW-REC-GDL-03 through 06). The plan also includes statements about management activities that are suitable or not in various recreation sites.

The 2020 Forest Plan allows for various permitted uses, with guidance to reduce or mitigate conflicts with other uses and resources, including specific guidance to reduce the potential for human-wildlife conflict (FW-RSUP-GDL-01). Desired conditions in the plan include providing for public access to NFS lands via roads, trails, and airstrips (FW-ACCESS-DC-01 through 03). Goals and guidelines are included to address protection of other resources and provide for public safety. Plan components included in the 2020 Forest Plan from the grizzly bear amendments constrain increases in developed overnight recreation sites in the grizzly bear PCA and the amount of motorized access allowed in the grizzly bear PCA and Zone 1 (PCA-NCDE-STD-01 through 06); these components are discussed in more detail in the grizzly bear species assessment.

Designated areas

Designated areas are areas or features identified and managed to maintain their unique special character or purpose. They fall into several categories.

Administratively designated areas

These areas are designated in the 2020 Forest Plan or by other administrative action for a variety of purposes. Those purposes include maintaining natural ecological processes and/or systems [inventoried roadless areas (IRAs)], research or monitoring of natural and managed systems (research natural areas, experimental forests), wildlife management (Elkhorns Wildlife Management Unit), recreation and/or scenic values (national recreation trails, recreation areas, scenic byways, and the Smith and Missouri River corridors), and culturally significant landscapes (Badger-Two Medicine area). Desired conditions and other plan components are focused on maintaining the characteristics and supporting the purposes for the area designations. Plan components for some areas support large, undeveloped landscapes in a relatively primitive state, with little or no motorized access (IRAs, Badger-Two Medicine area). Others, such as national recreation trails or recreation areas have plan components specific to the individual area that may include motorized or other developed recreation opportunities.

In addition to these types of designations, the Planning Rule requires that plans evaluate and, if appropriate, recommend areas to be considered and potentially designated by Congress as wilderness (recommended wilderness areas) and as wild and scenic rivers. Although the final designation of these areas as Wilderness or as Wild and Scenic Rivers is made by Congress, the recommendations are made in Forest Plans, along with management direction related to those recommendations. Plan components for recommended wilderness areas focus on maintaining the characteristics that make each area suitable for wilderness recommendation (e.g. maintaining natural processes, large undeveloped areas, no motorized or mechanized travel, and others). Plan components for eligible wild and scenic rivers are based on maintaining the "outstanding remarkable values" for which they were identified. Depending on the values associated with each river or segment, certain management or recreational activities may be restricted or constrained for that river or segment. Plan components for inventoried roadless areas must comply with the 2001 Roadless Area Conservation Rule (36 CFR 294 Subpart B, published at 66 Fed Reg. 3244-3273), which prohibits activities that have the greatest likelihood of altering and fragmenting landscapes or the loss of roadless area values and characteristics.

The acreage and miles of areas that would be designated or recommended under the Preferred Alternative are shown in Table 3 above, along with the acreage and miles under the two 1986 Forest Plans for comparison.

Congressionally designated areas

Congressionally designated areas include wilderness, wilderness study areas, the Rocky Mountain Front Conservation Management Area (CMA), national historic trails, and the Continental Divide National Scenic Trail (CDNST). Management of these areas is directed by regulation and is supplemented by plan components that support those regulations and maintain the characteristics and support the purposes for the area designations (refer to appropriate sections in the 2020 Forest Plan for components that support these designations). Plan components for wilderness, wilderness study areas, and the Rocky Mountain Front CMA all emphasize natural ecological processes, limited evidence of humans, limited or no motorized or mechanized uses, and large expanses of undeveloped landscape. Historic and scenic trail plan components support historic, cultural, and scenic values through limited evidence of motorized uses, timber harvest, and other specified activities. The acreage or miles of area or trail under these designations is not established in the Forest Plan and therefore would not change under the 2020 Forest Plan. Amount of area or miles in these designated area types is discussed in the context of specific habitats in the species assessments.

Benefits to people: multiple uses and ecosystem services

The plan addresses management of uses and resources that contribute to the social and economic sustainability of local communities and the public under this heading. These uses include things such as timber harvest, mineral extraction, and livestock grazing as well as clean air, clean water, carbon

sequestration, and others. The full set of plan components for these benefits is in the 2020 Forest Plan (see Appendix A for components cited in the BA). Management of activities and uses that fall under this category and that may have impacts to species addressed in the species assessments are summarized briefly here.

Livestock grazing

The proposed action would not change the amount of land in grazing allotments. The amount and type of grazing allowed on those lands is established through planning and analysis specific to grazing allotments and grazing permits. The 2020 Forest Plan includes components that could influence decisions about the amount and type of grazing allowed when permits or annual operating plans are issued or renewed. The plan establishes as desired conditions that sustainable grazing opportunities exist (FW-GRAZ-DC-01), and that grazing allotments have stable and healthy soils, native forage, and hydrologic integrity and provide for wildlife habitat and forage needs (FW-GRAZ-DC-02 and 03 and FW-GRAZ-GO-01). Standards and guidelines in the proposed action guide managers to conserve and maintain vegetation and habitats particularly in riparian and aquatic systems (FW-GRAZ-STD-02, FW-GRAZ-GDL-01 through 07). Plan components retained in the 2020 Forest Plan from the grizzly bear amendments constrain increases and some types of livestock grazing in the grizzly bear PCA (PCA-NCDE-STD-10 and 11, and PCA-NCDE-GDL-09); these components are discussed in more detail in the grizzly bear species assessment.

Timber

The removal of timber from NFS lands is addressed in Forest Plans in two distinct categories: timber *production* (see Table 3 above), which is "the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be but into logs, bolts, or other round sections for industrial or consumer use" (refer to the proposed plan Timber section), and timber *harvest*, which is the removal of trees for wood fiber use or other multiple-use purposes. The planning rule requires Forest Plans to identify lands that are suitable and those that are not suitable for timber *production*. The acreage identified as suitable for timber production under the Preferred Alternative, as well as lands that are unsuitable but where harvest may occur for other multiple use purposes, is shown in Table 3 above, along with the acreage identified in the 1986 Forest Plans, for comparison.

Desired conditions in the 2020 Forest Plan include regularly scheduled harvest that contributes to economic sustainability from lands identified as suitable for timber production (FW-TIM-DC-01, 03 and 04, and FW-TIM-GO-01), and that such lands are actively managed to minimize disturbance-related loss of the timber resource (FW-TIM-DC-02). The plan sets objectives for projected timber sale quantity (FW-TIM-OBJ-01 and 02) in terms of average annual million cubic and board feet of timber volume. A number of standards and guidelines constrain timber production and harvest practices to protect soils and watersheds (FW-TIM-STD-01) and to assure re-stocking of trees (FW-TIM-STD-02). Other standards and guidelines constrain the type or nature of harvest that can or should be used, in order to limit negative impacts to other resources, including wildlife habitat (FW-TIM-STD-04 through 10, and FW-TIM-GDL-03). Additional components guide managers to include considerations other than greatest dollar return or timber output when planning vegetation treatments (FW-TIM-STD-03, and FW-TIM-GDL-01 and 02). Plan components in the NRLMD, which is adopted in its entirety into the proposed plan, would constrain certain types and quantities of harvest in occupied lynx habitat. Those components are discussed in more detail in the Canada lynx species assessment.

Fish and wildlife

The 2020 Forest Plan includes components that address the opportunity for humans to enjoy fish and wildlife populations through uses such as fishing, hunting, and viewing. Desired conditions focus on maintaining availability of fish and wildlife species for those uses. The 2020 Forest Plan, Alternative F, includes a goal (FW-FWL-GO-01) and guideline (FW-FWL-GDL-01) to work with MFWP to identify

and implement habitat management actions to influence the distribution of big game species during hunting seasons.

Minerals and energy

The 2020 Forest Plan includes desired conditions to supply mineral and energy resources while assuring sustainability and resiliency of other resources and consistency with other desired conditions (FW-EMIN-DC-05 and 06). Guidelines in the 2020 Forest Plan would minimize potential adverse effects to riparian and aquatic resources (FW-EMIN-GDL-01 and 02). Plan components retained in the 2020 Forest Plan from the grizzly bear amendments constrain minerals and energy development in the grizzly bear PCA and Zone 1 (PCAZ1-NCDE-STD-05 through 11, and PCAZ1-NCDE-GDL-03 through 07) by limiting surface occupancy, and requiring specific actions or practices that would minimize a variety of potential impacts to grizzly bears. These components are discussed in more detail in the grizzly bear species assessment.

Other resources

In addition to plan direction for the resource areas described above, the 2020 Forest Plan includes programmatic direction addressing soil, air quality, cultural, historic and tribal resources, land status and ownership, infrastructure, forest products, non-recreation special uses, public information and education, and carbon storage and sequestration. Plan components for management of these activities and uses do not have direct relevance to the species considered in this assessment unless noted specifically in the assessment section.

Summary of plan components specific to grizzly bear

In December 2018 the Forest Plan Amendments to Incorporate Relevant Direction from the Northern Continental Divide Ecosystem Draft Grizzly Bear Conservation Strategy (U.S. Department of Agriculture, Forest Service, 2018a) were signed and became part of the existing (1986) Helena National Forest and Lewis and Clark National Forest Plans. The purpose of the amendments is to "provide consistent direction that will support the continued recovery of the NCDE grizzly population", and provide a regulatory mechanism for management that will sustain a recovered population (U.S. Department of Agriculture, Forest Service, 2018a). Plan components in the amendments are retained in the 2020 Forest Plan (refer to Appendix A).

Throughout this BA, the plan component identifiers used in the 2020 Forest Plan are cited when referencing grizzly bear direction, corresponding to identifiers in Appendix A. These components are the same as those included in the Forest Plan Amendments to Incorporate Relevant Direction from the Northern Continental Divide Ecosystem Draft Grizzly Bear Conservation Strategy (U.S. Department of Agriculture, Forest Service, 2018a), but the identifiers differ from those in the amendments. Following each component, Appendix A includes the identifier from the grizzly bear amendment as well in order to allow cross-referencing if needed.

Additional management related to conservation of grizzly bear habitat is incorporated throughout the plan as components that are specific to minimizing impacts of activities or uses on wildlife and their habitats. Specific plan components are discussed in detail in the grizzly bear species assessment.

Summary of plan components specific to Canada lynx and Canada lynx designated critical habitat

Direction designed to conserve and promote the recovery of Canada lynx was incorporated into both of the 1986 Helena and Lewis and Clark NF plans in 2007 when those plans were amended to include the Northern Rockies Lynx Management Direction (NRLMD) (U.S. Department of Agriculture, Forest

Service, 2007c). That management direction has been retained in the 2020 Forest Plan, and can be found in Appendix F of the 2020 HLC NF Forest Plan, which is appended to this document as Appendix B.

The HLC NF includes lynx habitat that is currently considered occupied as well as habitat and areas that are currently unoccupied (U.S. Department of Agriculture, Forest Service, 2006b). The management direction in the NRLMD applies to occupied habitat and is to be considered in unoccupied habitat. The 2020 Forest Plan includes additional management direction specifically addressing lynx habitat regardless of occupancy, in vegetation desired conditions that call for dense, multistory spruce/fir stands that provide high quality lynx habitat forestwide (e.g., FW-VEGT-DC-01) and in some GAs. Desired condition FW-WL-DC-09 states that boreal forest habitats forestwide will provide for lynx needs at the scale of a female lynx home range. Additional management direction supporting wildlife habitat is incorporated throughout the plan in appropriate sections and is discussed in more detail in the Canada lynx species assessment.

Summary of plan components specific to North American wolverine

Plan components that would conserve the North American wolverine and its habitat on the HLC NF are incorporated into the coarse filter components intended to provide for the integrity of the ecosystems on which wolverines depend, and into fine filter components addressing the need for connectivity among habitats used by wolverines. These components are within the Wildlife and the Vegetation sections of the revised plan, and include the following:

- Desired conditions for maintaining wildlife habitat throughout native species' potential natural ranges and maintaining vegetation composition, structure, and distribution that would provide for wildlife habitat needs (FW-WL-DC-01 through 04).
- Desired conditions to provide habitat connectivity for wolverine and other wide-ranging species between public lands in northern Montana and those in south and southwestern Montana, including lands in the Greater Yellowstone Ecosystem (DI-WL-DC-01, RM-WL-DC-01, and UB-WL-DC-01).
- Goals to work with other agencies and partners to identify and manage for wildlife movement across ownerships, and to collaborate on management and conservation strategies to conserve wildlife and prevent the need for additional listings under the ESA (FW-WL-GO-01 and 02, and 04, through 06.
- A desired condition to minimize disturbance of species in key seasonal habitats, such as denning and pup-rearing areas (FW-WL-DC-06).

Terrestrial wildlife species assessments

Grizzly bear

Consultation history

The history of ESA section 7 consultation on the proposed action is summarized in Appendix B.

There is one prior formal consultation with relevance to this proposed action. In December 2018 the Forest Service (FS) completed analysis and signed the decision amending four Forest Plans, including the existing (1986) HLC NFs plans, to incorporate programmatic management direction for the NCDE grizzly bear population (U.S. Department of Agriculture, Forest Service, 2018a). The amendments provide a framework for decision-making, and do not identify nor authorize specific actions on the ground. The amendments were incorporated into the Helena NF and Lewis and Clark NF plans, and are also included in their entirety as part of the revised plan considered in this assessment. Therefore, the consultation that occurred for those amendments is relevant to the proposed action.

The BA for the amendments determined that implementing the amendments "may affect, and is likely to adversely affect" grizzly bears. The determination was based on the fact that motorized access continues in the recovery zone [Primary Conservation Area (PCA)] with some BMU subunits remaining slightly above target motorized route densities recommended under previous management direction, the presence of motorized routes in other management zones outside the PCA, presence of human activities at developed recreation sites, and potential short-term adverse effects to individual bears from vegetation management activities, livestock grazing, and minerals and energy development.

The FWS issued a BO in November 2017 stating that implementation of the amendments would not likely jeopardize the continued existence of the grizzly bear. They indicated that implementation "may result in adverse effects to individual grizzly bears over the life of the plans", and assume those adverse effects are most likely to occur as a result of access management and in subunits that do not meet recommended route densities or percentages of secure habitat. These adverse effects are not expected to reduce the likelihood of survival and recovery of the NCDE grizzly bear population. The FWS issued an Incidental Take Statement with the BO, with the benchmark ("baseline" in the amendments) level of motorized route density and secure core habitat as surrogate measures of take within the PCA. The BO also required terms and conditions that included mandatory adherence to certain specified standards and guidelines in the amendments, capping the allowed temporary increases in route density to occur on no more than three adjacent BMU subunits on each NF, and implementation of food/attractant storage orders in the PCA, Zone 1, and Zone 2.

The programmatic management direction in the amendments has been retained in its entirety in the HLC NF 2020 Forest Plan, and the effects of implementing that direction is expected to be the same as that discussed in the amendment BA and BO.

Species status and ecological information

Status

The grizzly bear is currently listed as a threatened species under the ESA. There are six grizzly bear recovery zones identified in the Grizzly Bear Recovery Plan (USFWS, 1993), five of which are currently considered occupied (Cecily M. Costello, Mace, & Roberts, 2016). A portion of the action area, including the entire Rocky Mountain Range GA and the north half of the Upper Blackfoot GA, is within the NCDE recovery zone (USFWS, 1993).

No critical habitat has been designated for grizzly bears at this time.

Habitat requirements and life history

The biology and ecology of grizzly bears has been described extensively in numerous other documents (USFWS, 2013a); *(U.S. Department of Agriculture, Forest Service, Northern Region, 2015)*; (U.S. Department of Agriculture, Forest Service, 2017), as has information on habitat use and availability specific to the NCDE and the HLC NF. We will briefly summarize key information from those sources, focusing on basic elements of grizzly bear life history and those that are relevant to the analysis in this assessment.

Grizzly bears are generalists that use a wide variety of habitats ranging from alpine meadows to montane conifer forests to low elevation foothills and prairie grasslands. Use of habitats by grizzly bears is influenced by food availability and by various human activities and human-created features on the landscape. Bear use of specific habitats is strongly influenced by the availability of foods at different times of the year. In spring, bears seek greening, nutrient-rich vegetation at low elevations and in meadows and riparian zones. Some bears may seek areas where winter-killed carrion is available, including in ungulate winter ranges and in livestock boneyards on private land. Summer habitat includes meadows, seeps, avalanche chutes and alpine areas that provide nutrient-rich vegetation, ground-dwelling

rodents, and insect larvae, including areas with downed wood where ant larvae may be abundant, and high elevation talus fields where moth larvae can be found. Bears also seek out glacier lily, biscuitroot, and other nutritious roots, as well as habitats providing berries, whitebark pine seeds, and a wide variety of other foods. In fall, some bears capitalize on remains of animals harvested by hunters. Habitat use is highly variable between areas, seasons, local populations, and individuals.

To date, most research has indicated that grizzly bears den at high elevations, but recently there is anecdotal evidence that some bears may be denning in low-elevation historic habitat in the foothills and prairies east of the Rocky Mountains in Montana (Northern Continental Divide Ecosystem Subcommittee, 2019). After emerging from dens, bears move to areas with early greening vegetation, generally at low elevations and including riparian corridors in the foothills and prairie. Although most bears in the NCDE recovery zone and surrounding areas appear to move to widely distributed mid and high elevation habitats during summer, some bears have been observed in low-elevation foothills and prairie areas, including agricultural fields east of the Rocky Mountains, throughout the summer and fall. Some female bears with litters that use low elevation areas east of the Rocky Mountains during summer may use "day dens", possibly for security and/or thermal relief (Northern Continental Divide Ecosystem Subcommittee, 2019).

Females in the NCDE first reproduce between ages 3 and 8, with an average age of first reproduction of 5.7 (Cecily M. Costello et al., 2016). Reproductive success is correlated with female body condition in fall (Robbins, Lopez-Alfaro, Rode, Tøien, & Nelson, 2012) (Belant, Kielland, Follmann, & Adams, 2006) and with the availability of high-energy summer foods (McLellan, 2015; C. C. Schwartz et al., 2006).

In general, population trend is the outcome of the relative influences of reproduction and mortality. In species such as grizzly bears that are long-lived and have low reproductive rates, adult female survival may be a key factor influencing population trend. McLellan (2015) and Proctor (2018) discussed the relative influences of high-energy foods, grizzly bear population density, and human access that both directly and indirectly contribute to grizzly bear mortality. They observed that the relative contributions of these factors to individual bear reproduction and survival as well as to population trend overall varied widely across years and study areas. Factors that affect grizzly bears are addressed in more detail below in the Existing Condition section and include discussion of those factors in the context of current management in the plan area.

Population status and distribution

Grizzly bears occur throughout northwestern North America, from Alaska and northern Canada south into the Northern Rocky Mountains and North Cascades. In the United States, six grizzly bear recovery ecosystems are identified. The North Cascades ecosystem in north central Washington has fewer than 20 bears (http://igbconline.org/conserving-grizzly-populations-2/ accessed 25 October 2019), and the combined Selkirk and Cabinet Yaak Ecosystems in northeastern Washington, northern Idaho, and northwestern Montana have an estimated combined total of fewer than 150 bears (ibid). The Cabinet Yaak population has been augmented with bears captured in the NCDE and relocated to the Cabinet Yaak area in an effort to promote recovery of that population.

The Bitterroot ecosystem lies along the boundary between east central Idaho and western Montana. Grizzly bears are not known to inhabit this ecosystem. In September 2017 the USFWS determined that, for the purposes of ESA Section 7 consultation, the grizzly bear "may be present" on the portion of the Bitterroot National Forest that is east of Highway 93. This area is outside but immediately adjacent to the Bitterroot Ecosystem, which lies west of Highway 93 and west and southwest of Missoula, Montana.

The Greater Yellowstone Ecosystem (GYE) is centered around Yellowstone National Park in northwestern Wyoming and southwestern Montana. This ecosystem has been continuously occupied since before grizzly bears were listed under the ESA. There are an estimated more than 700 bears in the GYE (www.fws.gov/mountain-prairie/es/gye , accessed 17 September 2019), which has met the recovery goals outlined in the Grizzly Bear Recovery Plan (USFWS, 1993). Grizzly bears occur in the GYE outside the

recovery zone, and the population has recently been de-listed twice, although court rulings have placed bears back on the list of threatened species each time. The most recent court ruling ("Crow Indian Tribe v. United States," 2018) focused on the potential connection between the GYE population and recovery of the NCDE population. Genetic surveillance has not detected evidence of immigration of GYE bears into the NCDE, nor of NCDE bears emigrating to the GYE through 2017 (C. M. Costello & Roberts, 2019).

The NCDE is in northwestern and north central Montana, and includes Glacier National Park, portions of the Flathead, Kootenai, Lolo, and Helena-Lewis and Clark National Forests, and part of the Blackfeet Indian Reservation. This ecosystem includes the Bob Marshall Wilderness Complex, and the recently designated Rocky Mountain Front Conservation Management Area. The NCDE has been occupied by grizzly bears continuously since they were listed under the ESA. The population in 2015 was estimated at over 900 bears (Cecily M. Costello et al., 2016), and as of 2017 was estimated to be over 1,000 (MFWP unpublished data cited in (Northern Continental Divide Ecosystem Subcommittee, 2019). The NCDE grizzly bear population has been expanding geographically as well (ibid), with bears increasingly observed in prairie and agricultural landscapes more than 50 miles east of the recovery zone. Costello and others (C. M. Costello & Roberts, 2019) estimate that 35% of the occupied range of grizzly bears currently occurs outside of the Demographic Monitoring Area, which is the combined PCA and Zone 1. They also estimate that the current distribution represents a 42% increase from 2004 and a 25% increase from 2010 (ibid).

Existing condition

Information regarding the current status of grizzly bears in the action area, along with information regarding the existing status and management of key factors that have been identified as having the potential to impact grizzly bears is provided in this section to help establish the baseline conditions within the action area.

Note that in sections describing current management under the 1986 forest plans, reference is made to components from the 2018 Forest Plan Amendments to Incorporate Relevant Direction from the Northern Continental Divide Ecosystem Draft Grizzly Bear Conservation Strategy (U.S. Department of Agriculture, Forest Service, 2018b). To reduce confusion, we used the specific plan component identifiers (e.g., PCAZ1Z2-NCDE-STD-01) as updated for the 2020 Forest Plan, so that they did not differ from references to the same components discussed in the Environmental Consequences section. The original plan component identifiers used in the GB Amendments are shown with the updated identifiers in Appendix A, to allow cross-referencing if needed.

Population status and distribution in the plan area

As discussed in the above paragraph, the grizzly bear population in the NCDE appears to be at or above 1,000 bears and has been increasing, (C. M. Costello & Roberts, 2019) (Northern Continental Divide Ecosystem Subcommittee, 2019). It is not possible to determine the number of bears inhabiting specific portions of the NCDE.

The Rocky Mountain Range GA and the north half of the Upper Blackfoot GA are within the NCDE recovery zone/PCA, where grizzly bears have been known to occur since before they were listed under the ESA. The FWS included the entire Upper Blackfoot GA and a portion of the Divide GA in its map of distribution for the NCDE population as of 2014 (https://www.fws.gov/mountain-prairie/es/species/mammals/grizzly/GBdistributions.jpg, accessed 24 October 2019). Based on recent observations of grizzly bears in the Big Belt Mountains and on private land between the Little Belt and Highwoods mountain ranges, the FWS has indicated that grizzly bears ‘may be present’ throughout the most of the HLC NF, with the exception of the Snowies, Crazies, and Castles GAs and the portion of the Big Belts GA that lies south of U.S. Highway 12 (USFWS map dated October 2018; see project file). Between 2009 and 2018 there were several verified observations of grizzly bears between the NCDE and

the GYE populations (C. M. Costello & Roberts, 2019) including in or near the Elkhorn, Big Belt, and Little Belt mountain ranges on the HLC NF.

A large portion of the HLC NF lies between the NCDE and GYE recovery zones and may have potential to provide genetic and/or demographic connectivity between those ecosystems. The issue of connectivity is discussed in the section below under the subheading 'Connectivity'.

Factors affecting grizzly bears

In 1975 the FWS identified habitat destruction and modification as major contributing factors leading to the listing of the grizzly bear as a threatened species under the ESA (U.S. Department of the Interior, 1975a). The listing identified decreases in historical range, the isolated nature of remaining populations, building of roads and trails in formerly secure grizzly bear habitat, and livestock grazing practices as factors contributing to the need for the listing. Since that time, habitat protection measures have focused primarily on providing secure habitat (USFWS, 2011) and on reducing both direct and indirect sources of mortality (USFWS, 1993, 2011, 2013b). Grizzly bear population recovery in portions of the US and Canada has been at least in part an outcome of legal protection and cessation of excessive killing in the form of unregulated hunting and government-established bounty systems (McLellan, 2015).

The Conservation Strategy for the Grizzly Bear in the Northern Continental Divide Ecosystem (Northern Continental Divide Ecosystem Subcommittee, 2019) identifies and provides management guidance for several factors that influence grizzly bears through direct and indirect mortality risk, as well as potential disturbance and displacement from habitat. This BA addresses those factors that are affected by management on NFS lands, as guided by the programmatic direction in Forest Plans: food/attractant management, habitat security/motorized access (both summer and winter), developed recreation, other recreational activity including hunting, connectivity, livestock grazing, vegetation management (including fuels management), and minerals and energy uses. This section provides brief discussion of the specific risk factors, followed by a summary of current management direction and status of each risk factor on HLC NF lands.

Food and attractant management

General effects of food and attractant management on grizzly bears

In the NCDE as a whole, the leading cause of grizzly bear mortality since at least 2004 has been agency removal (Cecily M. Costello et al., 2016) roughly half of which has occurred outside the PCA (Cecily M. Costello & Roberts, 2016), usually associated with livestock or other attractants on private and other non-NFS lands where food storage orders are not in use (Northern Continental Divide Ecosystem Subcommittee, 2019; USFWS, 2013a). Bears may be drawn to unsecured attractants, resulting in conflict and subsequent removal of those bears. Food storage orders on public lands can ensure that food and other attractants are stored so that grizzly bears cannot obtain access to them, preventing potential food-conditioning of bears and reducing the risk of conflict. Food storage orders are considered to be "the single most effective way to prevent bears from becoming food conditioned" (USFWS, 2013b) on public lands.

Current status of food and attractant management within the action area

A special order (food storage order) requiring that food, garbage, and other attractants are stored to make them unavailable to bears has been in place on the Rocky Mountain Range GA since at least 1987 and on the recovery zone portion of the Upper Blackfoot GA since at least 1993. These orders have been updated several times, most recently in 2010. In 2018 the HLC NF began implementing forestwide food storage orders that apply in all GAs that were not already included in an existing food storage order, in part to comply with the GB Amendment requirement to implement food storage orders in the PCA, zone 1, and zone 2 (PCAZ1Z2-NCDE-STD-01). Enforcement of the orders has been ongoing in the Rocky Mountain Range and Upper Blackfoot GAs for many years. Implementation of the orders elsewhere on the HLC NF

included a major information/education effort during the first year and will focus increasingly on enforcement thereafter. Information regarding food storage requirements is readily available at all FS offices and at trailheads and parking areas, as well as on the HLC NF website. Signs informing visitors of the existence of food storage requirements are posted at all NF public entry points on the Rocky Mountain Range GA and are being added elsewhere on the HLC NF as funding allows. All permits issued for activities occurring on lands administered by the HLC NF require adherence to food storage orders.

Information regarding violations of food storage orders is not available, but most violations do not result in bear-related incidents and are instead known because of consistent enforcement efforts e.g., see (Clark, 2014). As noted above, in the NCDE as a whole most management removals related to bears obtaining attractants occur on non-NFS lands. On the HLC NF portion of the NCDE, since implementation of the first food storage order on a portion of the Forest in the late 1980s, there has been only one known incidence of a management removal or death of a grizzly bear because of the bear obtaining improperly stored attractants.

Habitat security and motorized access

General effects of habitat security and motorized access on grizzly bears

Summer motorized travel

The NCDE Conservation Strategy (Northern Continental Divide Ecosystem Subcommittee, 2019) and the 5-year review of grizzly bear status (USFWS, 2011) identified habitat security as one of the key issues in grizzly bear population recovery (USFWS, 1993). Secure habitat is important to the survival and reproductive success of grizzly bears (Northern Continental Divide Ecosystem Subcommittee, 2019; USFWS, 1993, 2011), with motorized access commonly identified as a stressor that may have a negative impact on the availability of secure habitat for bears (Boulanger & Stenhouse, 2014; Mace, Waller, Manley, Lyon, & Zuuring, 1996; McLellan, 2015; Michael F. Proctor et al., 2018). In general motorized access has the potential to affect bears by increasing human interaction which increases potential for habituation or conflict, displacing bears from important habitats, and increasing energetic requirements related to disturbance by humans (USFWS, 2011).

Several research projects in the NCDE and other portions of the northern Rocky Mountains have reported varied information about the effects of motorized travel on grizzly bears. These studies have each asked slightly different questions, and measured access and impacts to bears differently. Cumulatively, however, they provide an outline of the potential for motorized access to impact bears. The following is a brief synopsis of some of the key research that has occurred regarding this issue over the past three decades.

Mace and others (Mace et al., 1996) found that in their western Montana study area female grizzly bears occupied home ranges with lower total road densities than unused areas. They found that a total (open plus closed) road density "of < 6 km/km^2 [9.65 mi/mi^2] differentiated the used from unused areas" (ibid), with road density calculated using a moving-windows type methodology. Within established home ranges, road density did not appear to influence use of those home ranges. Use by bears of habitats near roads was influenced by traffic volume and road type as well as by individual, sex, and season, and was also likely related to the spatial and seasonal availability of certain bear foods. This research also found that the females in the study spent over half their annual use in unroaded areas, with variation in that use based on season, habitat, and individuals. Some limitations of the study include relatively small sample sizes that precluded certain analyses and inferences, and that bear locations were obtained only twice a week and usually during morning hours when flight conditions were best, potentially influencing results by excluding other times of day when bear habitat use could have differed.

Other research has added to the understanding of potential impacts of motorized travel on grizzly bears. Research in Canada immediately north of the NCDE has been carried out over a span of three decades. In

1988 McLellan and Shackleton published results (McLellan & Shackleton, 1988) of the initial years of research in an area where a high level of resource extraction work and concomitant road building and use was occurring. They found that most bears in their study used habitats within 100m of roads less than expected, and they documented temporal patterns of avoidance, with areas near roads used at night but avoided during the day. Contrary to the later findings of Mace et al. (1996), McLellan and Shackleton found that yearlings and females with cubs used areas near roads more than other bears, possibly as a strategy to avoid encounters with adult male bears.

In 2015 McLellan published results (McLellan, 2015) of the multi-decade research effort that included analysis of data used in the 1988 publication along with data gathered in subsequent years. In his updated work, McLellan found that industrial activities in his study area, including use by the public of roads originally built for resource extraction, did not have a clear negative effect on population trend. The location of motorized routes relative to bear food sources appeared to be more important in McLellan's study area than the density of routes. McLellan recommended that managers should attempt to maintain or enhance high-energy foods while reducing human access into specific areas where and when those foods are abundant. He noted that the location of those high-value food areas may change over time in response to fire, vegetation management, and other influences, which may in turn require changes in management of road access. This approach is similar to suggestions made by the NCDE technical committee in 1998 to revise management recommendations for motorized access by creating seasonally secure areas based on habitats used by bears at key times of year (M. F. Proctor et al., 2018). This work put less emphasis on measures of route density, and more on maintaining secure habitat where food sources are available. McLellan's study (McLellan, 2015) was carried out in an area where grizzly bear hunting is legal, and where both public recreational use and industrial activities may have differed from those occurring in the Mace and others (Mace et al., 1996) research.

Boulanger and Stenhouse (2014) carried out research on the impact of roads on grizzly bears in Alberta, Canada, east of McLellan's study area and north of the NCDE. They reported on specific route densities at or below which most bear locations were documented, and above which the risk of mortality to all but adult male bears appears to increase. They identified road densities above which negative population trend could occur, and they recommend a threshold of 0.75 km/ km road density (1.2 mi/mi^2) in core grizzly bear conservation areas within their study area to ensure a viable grizzly bear population. A key aspect of the Boulanger and Stenhouse study was that road density was not measured in fixed units, but rather within a 300m radius of each bear observation. Although this method provided a "real time" picture of road density in an area actually being used by a bear at the time it is observed, it is not directly comparable to measures of road density in other areas that are made in fixed units and calculated by different methods. As in McLellan's study area and unlike in the NCDE, bear hunting was allowed in Boulanger and Stenhouse's study area. The authors also noted that they lacked information about traffic volumes and about habitat quality and quantity, which they suggested are likely to influence the mortality risk, reproductive rate, and disturbance/displacement from roads that occurs and therefore that they observed. This research focused specifically on road density and did not address any potential role or influence of secure habitat areas.

In a comprehensive review of research into the relationships between motorized access and grizzly bears, Proctor and others (2018) cited research findings (e.g., (Nielsen et al., 2004; Proctor, Lamb, & Machutchon, 2017) indicating that distance to roads and location of roads in relation to certain habitats may be as or more important than road density in predicting impacts to bears. Proctor et al. also noted that the spatial arrangement of motorized routes and security areas may be critically important in terms of the degree to which bears may be affected by motorized access. They stated, "…evenly spaced roads, even at an otherwise acceptable road density, can provide very little security in patches within the range of average daily movements" (M. F. Proctor et al., 2018). In other words, the key to limiting impacts of roads on bears is tied to availability, location, and distribution of secure habitat that is a function of not simply numeric density of motorized routes, but the spatial arrangement in which they occur. In its

updated Motorized Access Taskforce Report (IGBC, 1998), the IGBC stressed that evaluation of open motorized route density alone does not provide a complete measure of the effects of motorized access on use of habitats by grizzly bears, but that measures of the presence of "core areas" free of high levels of human use are also important. Most studies on the effects of motorized access on bears have reported on the importance to bears of having a minimum percentage of their home range in blocks secure from the influence of motorized travel (e.g., (Mace et al., 1996; Proctor et al., 2017; C. C. Schwartz, Haroldson, & White, 2010; Wakkinen & Kasworm, 1997). Measures and recommendations of the appropriate size of secure habitat patches have varied based on study area, research questions, research methods, the stated purpose of providing security (e.g., to limit direct mortality risk versus to limit displacement from foraging habitat) and other factors.

Winter motorized over-snow travel

The impacts of winter activities on denning bears are not well studied (Teisberg, Madel, Mace, Servheen, & Robbins, 2015). Mace and others (2015) assessed the distribution of grizzly bear dens in the NCDE with respect to areas open or closed to motorized over-snow use. They found no apparent avoidance by grizzly bears of areas open to winter over-snow use, and den distribution was similar to the availability of habitat. Linnell and others (2000) reported that bears will den within 0.6-1.2 miles of areas of human activity, and appear to be undisturbed by most activities occurring at distances greater than 0.6 miles of dens. Additional anecdotal evidence (Hegg, Murphy, & Bjornlie, 2010) and monitoring data (U.S. Department of Agriculture, Forest Service, 2006a) did not document abandonment of dens as a result of motorized over-snow travel in the vicinity of dens in the GYE. Litter abandonment due to snowmobiling activity has not been documented in the lower 48 states (Hegg et al., 2010), nor have adverse effects to bears from snowmobiling been substantiated (Mace & Waller, 1997a). Despite this information, however, bear research scientists and managers have suggested that in the period shortly before or after den emergence in the spring, females with cubs could be vulnerable to disturbance by snowmobiles because of limited mobility of cubs and high energetic needs of lactating females (Haroldson, Ternent, Gunther, & Schwartz, 2002; Mace & Waller, 1997a, 1997b).

Management and status of habitat security and motorized access within the action area

Motorized access management guidance in the NCDE

Based on preliminary reports (Mace & Manley, 1993) from the Mace et al. research discussed above, the Interagency Grizzly Bear Committee (IGBC) Taskforce on Motorized Access recommended that thresholds be established for motorized access route density and for "core" (i.e. secure) habitat in grizzly bear recovery zones (Interagency Grizzly Bear Committee Taskforce, 1994). In response to a lawsuit and in order to complete consultation on their Forest Plan, the Flathead NF developed Forest Plan Amendment 19 (USDA, 1995) establishing motorized route density and core area standards that were based on an unpublished review of those preliminary results (Mace, 2004). Similar recommendations were incorporated into interim guidelines for motorized access management for the NCDE (Northern Continental Divide Ecosystem (NCDE) Access Task Group, 1995). In 1998 the IGBC taskforce updated its guidance on motorized access management (Interagency Grizzly Bear Committee Taskforce, 1998) after considering additional research, analysis, and several years of implementation of the 1994 guidelines. The NCDE taskforce group recommended adjustments to NCDE motorized access direction in 1998 and 2002 (IGBC Motorized Access Taskforce unpublished reports).

The 1998 IGBC taskforce recommended the use of the moving windows method for analyzing motorized access within recovery zones (Interagency Grizzly Bear Committee Taskforce, 1998). They also recommended that rather than reporting linear route densities, managers should report the percent of an analysis unit (BMU Subunit) within a specified route density category and the percent meeting criteria of secure habitat. This method provides a more accurate indication of the spatial mix of motorized routes and secure habitat than do other methods, and was therefore incorporated as a required protocol into the Flathead NF Amendment 19 (USDA, 1995), the NCDE Grizzly Bear Conservation Strategy (Northern

Continental Divide Ecosystem Subcommittee, 2019), and the Amendments to Incorporate the NCDE Grizzly Bear Conservation Strategy into Forest Plans (see PCA-NCDE-STD-01) (U.S. Department of Agriculture, Forest Service, 2018a).

The degree to which access management on NFS lands, as described above, has contributed to the observed population increase in the NCDE is unknown, since it has been applied only in portions of the ecosystem and at the same time as implementation of food storage orders, cessation of grizzly bear hunting and aggressive predator control efforts, and other efforts to reduce grizzly bear mortality and increase human tolerance of bears.

Motorized access management and status of secure habitat in the action area – recovery zone/PCA and zone 1

Prior to adoption of the GB Amendments in 2018, the existing (1986) LCNF plan did not contain motorized route management standards or guidelines specific to grizzly bears. The Interim Motorized Access Management Direction for the NCDE RZ (Northern Continental Divide Ecosystem (NCDE) Access Task Group, 1995) was used in project planning and guidance on the NCDE RZ portion of the LCNF; consideration of seasonal habitat security as recommended in the 2002 proposed updates to that direction was applied to planning and analysis of travel management in the RZ portion of the NCDE (U.S. Department of Agriculture, Forest Service, 2007e, 2009).

The existing (1986) HNF plan includes standards to maintain road densities in "occupied grizzly habitat", mapped in the plan as the north half of the Lincoln Ranger District (Upper Blackfoot GA), at the 1980 density of 0.55 mi/mi^2. The Interim Motorized Access Management Direction for the NCDE (Northern Continental Divide Ecosystem (NCDE) Access Task Group, 1995) and the IGBC Motorized Access Task Force Report recommendations (Interagency Grizzly Bear Committee Taskforce, 1998) have been used as guidance for management and analysis of motorized access in the HLC NF portion of the NCDE recovery zone.

The GB Amendments adopted by the HLC NF and other forests in 2018 established that in the PCA (which is the same area as the recovery zone) the levels of open motorized route density (OMRD) and total motorized route density (TMRD) are not allowed to increase above the 2011 baseline, nor are levels of "secure core" (calculated slightly differently than "core" discussed above) allowed to decrease below the 2011 baseline (PCA-NCDE-STD-03), except under certain conditions detailed in the GB Amendments (PCA-NCDE-STD-02, PCA-NCDE-STD-03, PCA-NCDE-STD-04, PCA-NCDE-STD-05). Motorized route densities and amount of secure core in the BMU Subunits within the HLC NF portion of the NCDE recovery zone are shown in Table 5, as reported in the most current biennial motorized access report required by the GB Amendments and NCDE CS (Ake, 2017) for the Rocky Mountain Range GA, and for the Upper Blackfoot GA as reported in the Biological Opinion on the Effects of the Blackfoot Non-Winter Travel Plan on Grizzly Bears (U.S. Department of Interior, 2016c), to reflect full implementation of the travel plan in that area. Information in Table 5 includes all lands within the Subunits, per the reporting methodology and requirements established in the GB Amendments (U.S. Department of Agriculture, Forest Service, 2018a) and the NCDE CS (Northern Continental Divide Ecosystem Subcommittee, 2019).

Table 5. Total motorized route density and open motorized route density by GA and BMU subunit in the HLC NF portion of the NCDE recovery zone[1]

GA	BMU	Subunit	≥75% NFS lands	TMRD percent > 2 mi/mi2	OMRD percent >1 mi/mi2	Secure core percent of area
Rocky Mtn. Range	BATM	Badger	no	0	0	73
		Heart Butte	no	0	1	61

GA	BMU	Subunit	≥75% NFS lands	TMRD percent > 2 mi/mi2	OMRD percent >1 mi/mi2	Secure core percent of area
		Two Medicine	no	1	2	78
	BITE	Birch	no	0	0	93
		Teton	no	5	11	71
	DELK	Falls Creek	no	0	0	85
		Scapegoat	no	1	5	78
	NFSR	Lick Rock	yes	0	0	100
		Roule Biggs	yes	0	0	100
	SUBW	South Fork Willow	yes	3	14	81
		West Fork Beaver	yes	5	17	80
	TESR	Deep Creek	no	3	9	67
		Pine Butte	no	2	7	64
Upper Blackfoot[2]	MLFK	Alice Creek	no	10	12	74
		Arrastra Mountain	yes	17	16	75
		Red Mountain	yes	21	21	63

[1]Source: 2017 Biennial Report of Motorized Access Baseline within the Primary Conservation Area (PCA), Northern Continental Divide Ecosystem (NCDE). Unpublished report prepared by Kathy Ake, Flathead NF/NCDE, November 2019.
[2]Source for Subunits in Upper Blackfoot GA: Biological Opinion on the Effects of the Blackfoot Non-Winter Travel Plan on Grizzly Bears (U.S. Department of the Interior, Fish and Wildlife Service, 2016a), to reflect status after full implementation of the plan.

The GB Amendment to the HNF plan requires that in the area identified as zone 1, which is outside the recovery zone and therefore does not have BMU subunits established, linear motorized route density as measured over the entire HLC NF zone 1 area must be maintained at or below the 2011 baseline (Z1-NCDE-DC-01). Temporary routes are not included as changes to motorized route density in the HLC NF portion of Zone 1. The amendment allows the 2011 baseline to be adjusted for activities or projects occurring after that time that have received consultation. The 2011 baseline was adjusted after consultation and signing of the Record of Decision for the Blackfoot Non-Winter Travel Management Plan in 2016 (U.S. Department of Interior, 2016c; USDA, 2017). The motorized route density in the entire area outside the Recovery Zone (PCA), corresponding to Zone 1, after full implementation of the travel plan is 1.1 mi/mi^2 [p. 28 of the Biological Opinion on the Effects of the Blackfoot Non-Winter Travel Plan on Grizzly Bears (U.S. Department of the Interior, Fish and Wildlife Service, 2016a)].

Motorized access management and status of secure habitat in the action area – outside the recovery zone (zones 1, 2 and 3)

The 2018 GB Amendments to the existing (1986) Helena NF plan and Lewis and Clark NF plan do not require motorized access management in Zones 2 and 3. As discussed above, managers and researchers have recognized the importance of secure areas to grizzly bears (USFWS, 1993, 2011) (Northern Continental Divide Ecosystem (NCDE) Access Task Group, 1995) (Interagency Grizzly Bear Committee Taskforce, 1998) (Mace et al., 1996) (McLellan, 2015) (McLellan & Shackleton, 1988) (Michael F. Proctor et al., 2018). Therefore, measures of secure habitat in the areas outside the NCDE RZ (Zones 2 and 3) where grizzly bears may be present provide some indication of the potential for impacts of human activities on bears that may use those areas.

The existing (1986) HNF and LCNF Forest Plans include components that limit or prohibit motorized access in some areas (e.g., for elk security, recommended wilderness areas, and others), creating secure habitat that may be used by grizzly bears. Areas such as Designated Wilderness, Wilderness Study Areas, and Inventoried Roadless Areas, all of which are established by law, effectively limit or prohibit motorized access in some areas and thereby contribute to secure habitat that could be used by grizzly bears.

The amount of secure habitat potentially available to bears in Zones 1, 2, and 3 is displayed in Table 6 below. The acreage of secure habitat is reported for individual Grizzly Bear Analysis Units (GBAUs), which we delineated in Zones 1, 2 and 3 on the HLC NF for the purposes of analyzing potential impacts to bears of various forest management activities. GBAUs used hydrologic boundaries that were adjusted (generally combined all or in part) based on average female home range size, topography, range of habitat types, range of elevations, and presence of private lands. All GBAUs are entirely within the NF boundary, although some include private land inholdings within the external NF boundary. For this analysis and consultation, secure habitat includes areas that are $\geq$ 500m from any motorized route and that are $\geq$2500 acres in size. Detailed documentation of the process and rationale for delineating GBAUs and for calculating secure habitat is available in the project file. Table 6 displays only secure habitat and total acres of NFS lands and does not include any private lands (inholdings) that may occur within GBAUs. While the GB Amendments require no net change to the baseline linear density of motorized routes in Zone 1 as described above, the spatial location of routes could change, which could in turn change the amount and quantity of secure habitat within those GBAUs. Therefore, we report in Table 6 the amount of potentially secure habitat available in the two GBAUs in Zone 1 in in order to facilitate future analysis and comparison.

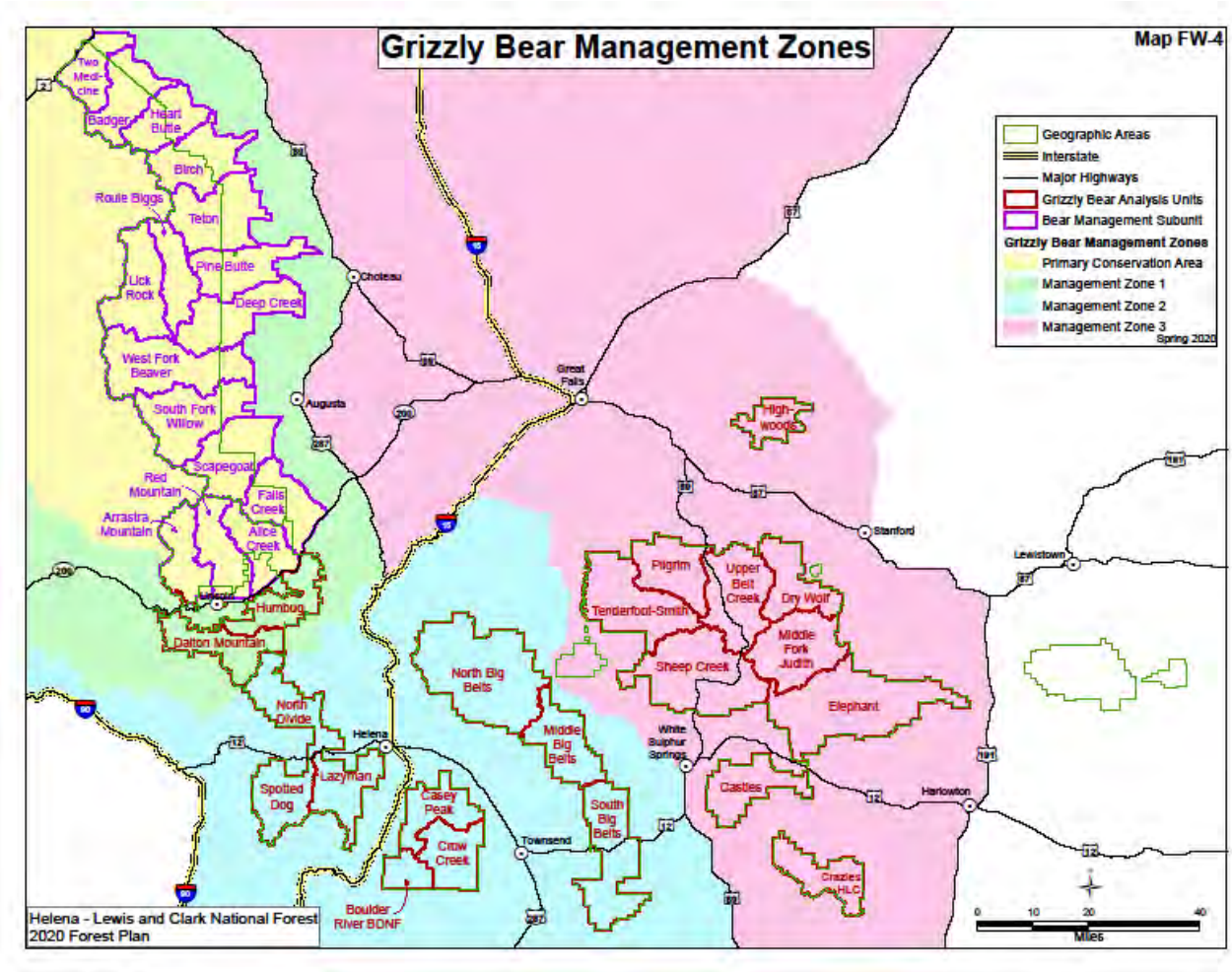

Figure 2. Grizzly bear management zones and analysis units

Table 6. Acreage and percent of potentially secure habitat by GBAU, NFS lands only

Grizzly bear management zone	Geographic area	Grizzly Bear Analysis Unit (GBAU)	Total NF Acres in GBAU	Acres of potentially secure habitat	Percent of GBAU that is potentially secure habitat	Number potentially secure habitat areas[1]
Zone 1	Upper Blackfoot	Dalton Mountain	82,276	31,191	**38%**	2
		Humbug	66,966	15,703	23%	2
Zone 2	Elkhorns	Boulder River BDNF	30,973	7,725	25%	1
		Casey Peak	60,455	32,847	54%	2
		Crow Creek	69,822	27,967	40%	2
	Divide	Lazyman	64,415	11,891	18%	2
		North Divide	72,195	16,484	23%	2
		Spotted Dog	66,723	18,942	28%	2
	Big Belts	Middle Big Belts	70,743	24,853	35%	2
		North Big Belts	171,431	75,085	44%	6
		South Big Belts	67,118	18,048	27%	2
Zone 3	Little Belts	Dry Wolf	74,307	23,277	31%	5
		Elephant	199,743	44,208	22%	10
		Pilgrim	72,942	39,615	54%	4
		Middle Fork Judith	110,601	65,619	59%	5
		Sheep Creek	127,729	5,039	4%	2
		Tenderfoot-Smith	113,449	60,276	53%	4
		Upper Belt Creek	103,762	33,158	32%	8
		Highwoods	42,290	26,368	62%	3
		Castles	69,708	7,325	11%	2
		Crazies HLC	57,667	22,154	38%	1

[1]Some patches of secure habitat cross GBAU boundaries and therefore may be counted in both GBAUs. Secure habitat patches or areas are shown here for each GBAU in which they occur, in order to indicate the potential for each GBAU to provide habitat security.

We chose to use 2500 acres, the convention adopted in the NCDE, as a minimum patch size for secure habitat. In some other areas (e.g., the Greater Yellowstone Ecosystem) a minimum patch size of 10 acres is used. The choice of minimum patch size affects the number and total acreage of secure habitat reported.

We also chose to buffer all routes existing in the HLC route database, regardless of whether they are legally open or closed to public travel. The database lacks information indicating the method by which routes are closed to the public (e.g., gate, berm, partial or total revegetation, etc.), as well as whether or not routes are currently passable by vehicle (e.g., some routes in the database have naturally re-vegetated to the point at which motorized travel is not physically possible, but information about which routes are in that state is not consistently available across the HLC NF at this time). Therefore the estimates of secure

habitat in Table 6 above are in most cases underestimates of actual secure habitat that exists on the ground, because an unknown number of routes that are physically impassable to motor vehicle use were buffered and excluded from secure habitat polygons.

The secure habitat amounts that we report above are useful mainly as a broad index of what may be available to bears that use these areas; actual bear use of any areas within Zones 2 and 3, and the degree to which they might be affected by motorized travel or other human uses or activities is dependent on many factors as described throughout this assessment.

Winter motorized travel

More than half (approximately 56%) of the HLC NF portion of the PCA is within designated wilderness, where over-snow motorized travel is prohibited. On the Rocky Mountain Range GA portion of the PCA, winter over-snow motorized travel is allowed only on main access roads, none of which are within modelled denning habitat, and on approximately 30,000 acres (of which about 8,000 acres overlap with modelled denning habitat). This snowmobile use in denning habitat is limited to relatively small portions of four (out of 12) grizzly bear subunits: Teton, Pine Butte, West Fork Beaver, and South Fork Willow. Snowmobile travel in that area is prohibited after March 31 (U.S. Department of Agriculture, Forest Service, 2007e, 2009). On the Upper Blackfoot GA, snowmobiling is allowed on about 53,000 acres (of which approximately 6,400 acres are modelled denning habitat) of the PCA, where it is prohibited after March 31 except in the Copper Bowls play area where snowmobile use is allowed until May 31 (U.S. Department of Agriculture, Forest Service, 2013). This snowmobile use overlaps with all three grizzly bear subunits in the Upper Blackfoot GA: Alice Creek, Arrastra, and Red Mountain. The GB Amendments included a plan component to cap the amount of area available to motorized over-snow travel in modelled denning habitat within the PCA (U.S. Department of Agriculture, Forest Service, 2018a):

- NCDE-STD-AR-08 Within modeled grizzly bear denning habitat in the NCDE primary conservation area, there shall be no net increase in the percentage of area or miles of routes designated for motorized over-snow vehicle use on NFS lands during the den emergence time period.

In the remainder of the Upper Blackfoot GA, areas north of Highway 200 but outside the PCA (specifically within the Dalton Mountain GBAU) are open to snowmobiling through March 31 on approximately 1,800 acres. This use overlaps with 4 acres of modelled denning habitat. Elsewhere in the Upper Blackfoot GA, areas south of Highway 200 are open to snowmobiling through April 15 on 70,000 acres; roughly 7,600 of those acres overlap modelled denning habitat. This use occurs within two GBAUs.

In the GBAUs across the rest of the HLC NF, dates during which over-snow motorized travel is allowed vary from yearlong to ending on May 15 (U.S. Department of Agriculture, Forest Service, 1999, 2002, 2005, 2007a, 2013; U.S. Department of Agriculture, Forest Service, Helena Lewis & Clark National Forest, 2016; U.S. Department of the Interior, Bureau of Land Management, & U.S. Department of Agriculture, 1995). Snowmobile use that extends beyond March 31 overlaps with 112,535 acres of modelled denning habitat. Many areas on the HLC NF are relatively dry, and snow can be intermittently present, so not all areas legally open to over-snow motorized travel are actually available during the entire time they are open.

Other indicators of habitat security

Another indication of existing habitat security for bears is the amount of area having designations that limit or restrict human activities, including motorized travel. Congressionally-designated wilderness areas, wilderness study act areas, inventoried roadless areas, conservation management area, and recommended wilderness areas may all provide some measure of habitat security for bears by prohibiting

or largely restricting motorized and mechanized travel, and by limiting other activities such as timber harvest, development of recreation sites, and others.

Of the 12 BMU Subunits on the HLC NF in the PCA, five are not entirely within designated wilderness, inventoried roadless area, conservation management area, or combinations of those. Of those five, 3 subunits in the Upper Blackfoot GA (Arrastra, Red Mountain, and Alice Creek) have between 23% and 38% of their area not in any of the above categories. Two subunits on the Rocky Mountain Range GA (Badger and Two Medicine) are not entirely within one of the above categories, with approximately 10% to less than 50% of NFS lands within the subunit not within one of those categories. All of the above subunits are within the PCA, however, and are therefore protected by standards in the GB Amendments from any loss in the baseline amount of "secure core".

Table 7 shows the acreage and percent of each GBAU in designated wilderness, wilderness study act areas, and/or inventoried roadless areas, all of which are established by law and are not affected by Forest Plans or their implementation, for Zones 1-3.

Table 7. Acreage of habitat by Grizzly Bear Analysis Unit (GBAU), and percent of total NFS lands in GBAUs that are in designated wilderness, wilderness study area, or inventoried roadless area

Grizzly bear management zone	Geographic area	Grizzly Bear Analysis Unit (GBAU)	Total NF Acres in GBAU	Acres (%) of GBAU in designated wilderness	Acres (%) of GBAU in wilderness study area	Acres (%) of GBAU in inventoried roadless area
Zone 1	Upper Blackfoot	Dalton Mountain	82,276	0	0	46,096 (56%)
		Humbug	66,966	0	0	40,164 (60%)
Zone 2	Elkhorns	Boulder River BDNF	30,973	0	0	0
		Casey Peak	60,455	0	0	37,596 (62%)
		Crow Creek	69,822	0	0	37,153 (53%)
	Divide	Lazyman	64,415	0	0	18,207 (28%)
		North Divide	72,195	0	0	16217 (22%)
		Spotted Dog	66,723	0	0	29,697 (45%)
	Big Belts	Middle Big Belts	70,743	0	0	40,267 (57%)
		North Big Belts	171,431	28,440 (17%)	0	83,354 (49%)
		South Big Belts	67,118	0	0	23,335 (35%)
Zone 3	Little Belts	Dry Wolf	74,307	0	0	52,872 (71%)
		Elephant	199,743	0	647 (0.3%)	91,196 (46%)
		Pilgrim	72,942	0	0	55,693 (76%)
		Middle Fork Judith	110,601	0	79,104 (72%)	95,669 (76%)
		Sheep Creek	127,729	0	0	19,284 (15%)
		Tenderfoot-Smith	113,449	0	0	78,123 (69%)
		Upper Belt Creek	103,762	0	0	46,933 (45%)

Grizzly bear management zone	Geographic area	Grizzly Bear Analysis Unit (GBAU)	Total NF Acres in GBAU	Acres (%) of GBAU in designated wilderness	Acres (%) of GBAU in wilderness study area	Acres (%) of GBAU in inventoried roadless area
		Highwoods	42,290	0	0	39,634 (94%)
		Castles	69,708	0	0	29,382 (42%)
		Crazies HLC	57,667	0	0	37,551 (65%)

Motorized travel is not allowed in designated wilderness areas and is allowed only on existing routes in wilderness study areas where that use occurred when the areas were designated. The federal regulations governing inventoried roadless areas prohibits activities that are likely to alter and fragment landscapes and that would cause loss or roadless characteristics, and it prohibits permanent road construction and reconstruction.

Recommended wilderness is designated within Forest Plans, and therefore the amount and location of recommended wilderness may change when new Forest Plans are implemented. Recommended wilderness areas overlap with inventoried roadless areas, but carry additional restrictions on human activities, including motorized and potentially mechanized travel. Table 8 shows the acreage and percent of GBAUs in recommended wilderness in the existing (1986) Forest Plans. Because there are very few recommended wilderness areas, Table 8 includes only those GBAUs where recommended wilderness occurs.

Table 8. Acreage of habitat by Grizzly Bear Analysis Unit (GBAU), and percent of total NFS lands in GBAUs that are in recommended wilderness area in existing (1986) Forest Plans

Grizzly bear management zone	Geographic area	Grizzly Bear Analysis Unit (GBAU)	Total NF acres in GBAU	Acres (%) of GBAU in recommended wilderness area
Zone 2	Divide	Spotted Dog	66,723	16, 653 (25%)
	Big Belts	North Big Belts	171,431	9,105 (5%)
		South Big Belts	67,118	8,420 (13%)

Management of recommended wilderness areas in the 1986 Forest Plans allowed existing uses, including motorized travel, if those uses did not conflict with the goal of protecting wilderness characteristics. Decisions about whether to retain existing motorized travel in recommended wilderness areas were made in travel management plans that included those areas. New construction of temporary or permanent routes is not currently permitted in recommended wilderness areas.

Developed sites

General effects of developed sites on grizzly bears

Developed sites are sites or facilities that accommodate human use; on NFS lands, the term is used to denote sites with features that are intended to accommodate use by the public and includes campgrounds, trailheads, rental or permit cabins, lodges, ski areas, and others (USFWS, 2013b). Developed sites on public lands are associated with frequent and/or prolonged human use that may include continuous or frequent presence of food and attractants. Although developed sites on NFS lands have been associated with very few management removals in the NCDE, they represent an ongoing potential for conflict and

possible grizzly bear mortality. The potential impact of developed sites on grizzly bears is tied to the effective implementation of food storage orders (see section above on food storage).

Current status and management of developed sites within the action area

Other than in the GB Amendments pertaining to the PCA (see next paragraph), the existing (1986) Forest Plans do not specifically set objectives for or limit the number, type, or location of developed sites on NFS lands, except where management related to specific designations (e.g., designated wilderness, recommended wilderness, etc.) may influence management or establishment of developed sites. The HLC has a total of 215 developed recreation sites (not including permit cabins and lodges) spread across the action area, ranging from boating access points to interpretive pullouts to campgrounds to trailheads. Users of these facilities are required to adhere to existing food storage orders. Holders of permits for developed recreation sites (e.g., recreation residences, permit lodges, etc.) can face both legal violations and permit consequences, including suspension or revocation of their permit, for failure to comply with food storage orders. Food storage orders are enforced at other developed sites through signs and information at kiosks and registration points, and through contacts with FS recreation and enforcement personnel. Information regarding food and attractant storage requirements is also posted on the HLC NF website, shared on social media, and is available at all offices.

The GB Amendment (U.S. Department of Agriculture, Forest Service, 2018a) includes limits in the PCA on developed sites that are available to the public for overnight use. Overnight sites are generally associated with food and other attractants, and thus pose a greater risk of bear-related conflict than day-use sites. Standard PCA-NCDE-STD-06 in the GB Amendment (U.S. Department of Agriculture, Forest Service, 2018a) places limits on the number and capacity of developed overnight recreation sites allowed in the PCA, in order to limit the potential for grizzly bear-human conflicts. In the HLC NF portion of the PCA there are currently a total of 27 developed recreation sites that allow overnight use (e.g., rental cabins, campgrounds, permitted lodges) and 98 permitted recreation residence cabins (U. S. Department of Agriculture, 2019). As noted above, all users of any developed recreation sites in the PCA are required to adhere to food storage orders, minimizing the risk of bear-human conflicts related to the presence and use of those sites. Developed sites in the PCA that are used under permit (e.g., recreation residences, permit lodges) may have their permits suspended or revoked for failure to adhere to food storage orders or other permit requirements.

Recreational activities, including big game hunting

General effects of recreational activities on grizzly bears

Recreation can have an impact on grizzly bears by increasing the potential for encounters with humans that may therefore increase the potential for conflict situations. Recreation may also create disturbance and displacement of bears from some habitats in response to the presence of humans. Recreation activities that involve overnight stays (e.g. at developed sites, as described in the section above, as well as dispersed camping and other activities) may increase the risk of bears encountering human food or other attractants and becoming food conditioned. The likelihood of bears encountering humans or being affected by human recreation activities depends on many factors, including the amount, pattern, and type of recreation, whether it occurs in or near areas used by bears, the availability of secure habitat, etc.

Hunting for big game (e.g., elk, deer, black bears, mountain lions, and other species) occurs on NFS lands. Hunting of grizzly bears is illegal in Montana but hunting for other species may result in mortality of grizzly bears through illegal kills, mistaken identity, and defense of life. Hunting-related grizzly bear mortalities accounted for 16% of human-caused grizzly bear mortalities in the NCDE between 1998 and 2017 (Northern Continental Divide Ecosystem Subcommittee, 2019). The numbers and timing of hunters in grizzly bear habitat is influenced by the type and number of animals that can be harvested and the timing and duration of hunting seasons, all of which are regulated by Montana Fish, Wildlife and Parks (MFWP). The FS influence on hunting is primarily through managing access, by managing the timing

(including seasonal) and location of motorized travel allowed on NFS system roads and trails. The FS also issues permits for outfitting and guiding activities, much of which occurs specifically to provide backcountry hunting opportunities.

Current status and management of recreational activity management within the action area

ROS categories provide some indication of the overall amount of area in which general types of recreation are allowed. Although ROS categories are not included in the existing (1986 Forest Plans), they can be useful in describing the general settings created by implementation of those plans, in turn providing some idea of the potential for encounters with humans, amount and type of developments, and types of human activity, as follows:

- Primitive - large, remote, often predominantly unmodified landscapes, no motorized travel, few or no structures, generally very low density of human presence. Where it occurs, vegetation management focuses on maintaining/restoring natural vegetation and ecosystem processes.
- Semi-primitive non-motorized - no motorized travel except for occasional temporary roads; some closed roads may exist, the few structures present are rustic in nature, humans are generally dispersed at relatively low density. Mechanized travel allowed. Any vegetation management emphasizes maintaining/restoring natural, resilient vegetation.
- Semi-primitive motorized - backcountry settings where motorized travel is allowed on existing designated routes, no construction of permanent roads allowed. Humans are generally dispersed at relatively low density except at some parking/portal areas. Any vegetation management emphasizes maintaining/restoring natural, resilient vegetation.
- Roaded natural - natural appearing with nodes and corridors of development that support higher concentrations of human use. Some developed sites with amenities. Motorized travel on well-defined road system as well as on other motorized routes.
- Rural - generally accessed from paved roads and often close to communities. Developed recreation sites designated for large groups.

Table 9 displays the current acreage of each ROS by GA. Only NFS lands are included here because any intervening private or other non-NFS lands may have different characteristics than the adjacent or surrounding NFS lands.

Table 9. Acreage of recreation opportunity setting by GA

GA	Total GA acres (NFS lands only)	Primitive acres (% of GA)	Semi primitive nonmotorized acres (% of GA)	Semi primitive motorized acres (% of GA)	Roaded natural acres (% of GA)	Rural acres (% of GA)
Big Belts	315,199	48,389 (15%)	107,470 (34%)	37,029 (12%)	112,754 (36%)	9,556 (3%)
Castles	69,709	0	16,876 (24%)	16,343 (23%)	36,490 (52%)	0
Crazies	57,667	0	33,899 (59%)	15,126 (26%)	8,642 (15%)	0
Divide	202,642	16,653 (8%)	84,469 (42%)	22,500 (11%)	70,212 (35%)	8,808 (4%)
Elkhorns	161,251	0	94,394 (59%)	6,450 (4%)	57,541 (36%)	2,853 (2%)
Highwoods	42,291	0	29,906 (71%)	8,219 (19%)	4,165 (10%)	0

GA	Total GA acres (NFS lands only)	Primitive acres (% of GA)	Semi primitive nonmotorized acres (% of GA)	Semi primitive motorized acres (% of GA)	Roaded natural acres (% of GA)	Rural acres (% of GA)
Little Belts	804,657	64,792 (8%)	225,659 (28%)	222,239 (28%)	288,729 (36%)	3,239 (<1%)
Rocky Mountain Range	778,022	453,091 (58%)	269,357 (35%)	24,553 (3%)	27,796 (4%)	3,226 (<1%)
Snowies	118,172	88,845 (75%)	3,977 (3%)	6,904 (6%)	17,770 (15%)	676 (1%)
Upper Blackfoot	333,617	86,733 (26%)	159,694 (48%)	7,090 (2%)	79,619 (24%)	481 (<1%)

The different GAs on the HLC NF differ in the proportion of lands in various ROS categories. GAs that are within the NCDE Recovery Zone (Rocky Mountain Range and portion of Upper Blackfoot GA) are predominantly in non-motorized settings where human density is anticipated to be low. These GAs include the PCA, approximately 91% of which is in non-motorized settings with low human density and little or no human development. Although zone 1 (south portion of the Upper Blackfoot GA) includes almost no primitive ROS, the majority (>61%) of that zone on the HLC NF is non-motorized with low human density and little development. In Zone 2 (Divide, Big Belts, and Elkhorns GAs), which may be important for genetic connectivity with the GYE, more than half (roughly 52%) of NFS lands are in primitive or semi-primitive non-motorized settings, with no motorized travel and relatively low density of human presence and activity. In Zone 3 slightly less than 40% of NFS lands meet that description.

In addition to areas designated as non-motorized through area designations and travel management plans and as described by ROS categories, the 1986 Forest Plans include direction to manage motorized travel during the hunting season in some areas in an effort to provide security for big game species. In the existing (1986) HNF plan, which applies to the Upper Blackfoot, Divide, Elkhorns, and Big Belts GAs, Forest Plan standards currently require management of open road density of between 0.1 mi/mi^2 and 2.4 mi/mi^2, depending on available hiding cover, during the big game hunting season. The existing LCNF plan, which covers the remaining GAs, does not include similar requirements but directs managers to "manage motorized use… to reduce effects on wildlife during periods of high stress (hunting seasons…)". These management strategies may limit the potential for hunting season-related impacts to grizzly bears by limiting hunter access and by providing areas of relative security that may be used by wildlife (e.g., grizzly bears) other than big game. Outfitting and guiding activities are managed through issuance of permits and through operating plans that designate the location of camps, number of user-days, and other aspects of that activity. All permitted activities occurring on NFS lands administered by the HLC NF must adhere to food storage orders.

Livestock grazing

General effects of livestock grazing on grizzly bears

The presence of livestock operations can benefit the long-term conservation of grizzly bears by maintaining large blocks of rangeland, and habitats that support a variety of wildlife species (Dood, Atkinson, & Boccadori, 2006). However, "… livestock use of surrounding national forests" was identified by the FWS as detrimental to bears at the time they were listed as threatened under the ESA (U.S. Department of the Interior, 1975b). Approximately 13% of known human-caused grizzly bear mortalities in the NCDE between 1998 and 2017 were due to management removals associated with livestock operations, although those occurred on non-NFS lands, primarily private lands along the Rocky

Mountain Front (Northern Continental Divide Ecosystem Subcommittee, 2019). Domestic sheep and goat grazing may be a threat to individual grizzly bears due to the relative ease with which bears may prey on these livestock. Some potential for human-bear conflict could occur at livestock carcass sites or during activities associated with livestock management. The presence of livestock may displace grizzly bears from some preferred habitats.

Current status and management of livestock grazing within the action area

Livestock grazing is an important use on the HLC NF, with its open landscapes and island mountain ranges that are largely surrounded by private agricultural lands. There are currently 240 active grazing allotments on the HLC NF. Table 10 shows the acres included in livestock grazing allotments by GA; most but not all allotted acres are currently active.

Table 10. Acreage of livestock grazing allotments by geographic area

Geographic area	GA acres (total)[1]	Grazing allotment acres	Percent of the GA in grazing allotment	Active allotments (2019)	Permitted head months[2] (2019)
Big Belts	449,719	233,854	52	32	14,036 cattle 3,315 sheep 1,901 PLP
Castles	79,317	56,315	71	12	6,468 cattle 377 PLP
Crazies	70,046	59,539	85	11	4,095 cattle 525 PLP
DIvide	231,767	134,425	58	23	7,326 cattle 1,175 PLP
Elkhorns	174,050	90,506	52	11	7,514 cattle 389 PLP
Highwoods	44,217	40,680	92	9	5,750 cattle
Little Belts	897,977	502,867	56	79	18,233 cattle 2,179 PLP
Rocky Mountain Range	797,941	175,547	22	26	6,755 cattle 18 PLP
Snowies[3]	121,760	57,227	47	22	4,057 cattle 919 PLP
Upper Blackfoot	354,505	77,991	22	15	3,980 cattle 2,739 sheep

[1]Acreage includes all lands within GA boundary because some allotments and/or permitted head months include both private inholdings and adjacent NFS lands

[2]A head month is defined as one month's occupancy by one animal (weaned or adult cow with or without calf, or a bull, steer, heifer, horse, burro, or mule, or five sheep or goats). ; PLP refers to "private land permit", which authorize grazing of generally unfenced private inholdings within a larger NF allotment.

[2]The Snowies GA is outside the current (October 2018) area where grizzly bears may be present, but is included here for completeness and future reference

Specific numbers of animals grazing on any given allotment, along with timing and duration of use, are established annually in Annual Operating Plans, and vary from year to year. Annual Operating Plans must comply with regulations and with Forest Plan direction, and are based on a permittee needs, range condition, and other resource considerations.

Although the presence of cattle grazing has not resulted in mortalities on NFS lands in the NCDE, the NCDE Conservation Strategy (Northern Continental Divide Ecosystem Subcommittee, 2019) and the GB Amendments (U.S. Department of Agriculture, Forest Service, 2018a) recognized the potential for some impacts to bears due to this use of NFS lands. Plan components for the PCA and Zone 1 in the amendments focus on reducing the potential for impacts to bears through permit requirements to reduce the risk of bear-human conflicts (PCAZ1-NCDE-STD-01), requiring reporting of livestock carcasses (PCAZ1-NCDE-STD-02), and capping the number of active cattle allotments (PCA-NCDE-STD-11). The amendments also guide managers and permittees to incorporate measures in the PCA to protect key grizzly bear food production areas from conflicting/competing use by livestock (PCA-NCDE-GDL-10).

Recognizing that grazing by small livestock, such as sheep, goats, and llamas present a greater potential for conflict with bears than do cattle (Northern Continental Divide Ecosystem Subcommittee, 2019), the amendments included standards to cap animal-unit months on sheep grazing permits returning to use from non-use status in the PCA (PCA-NCDE-STD-10), capping the number of active sheep grazing allotments and sheep animal unit-months in the PCA and Zone 1 (PCAZ1-NCDE-STD-03), and limiting the use of temporary small livestock grazing permits in the PCA and Zone 1 for purposes such as weed control (PCAZ1-NCDE-STD-04). The amendments also guide managers to reduce the number of active sheep grazing allotments in the PCS if the opportunity arises with willing permittees (PCA-NCDE-GDL-09). There are currently 5 active sheep grazing allotments on the HLC NF. Two are in the Big Belts GA (zone 2), totaling 2400 ewe/lab pairs, and three are in the Upper Blackfoot GA (PCA/Zone 1), totaling 2600 ewe/lamb pairs.

Vegetation management

General effects of vegetation management on grizzly bears

Vegetation management on public lands has the potential to affect grizzly bears through road building and use, which is discussed in the Habitat Security section above. Vegetation management can also result in negative effects to bears through removal of cover, alteration of forage, disturbance or displacement caused by management activities (such as cutting, stacking, thinning, piling, burning, etc.), and increased risk of conflict with humans carrying out activities related to vegetation management (Northern Continental Divide Ecosystem Subcommittee, 2019). Vegetation management, including both prescribed and naturally-ignited fire, can also have positive effects by maintaining or enhancing bear foods in certain habitat types (Kerns, Alexander, & Bailey, 2004; McLellan, 2015; Northern Continental Divide Ecosystem Subcommittee, 2019; Zager, Jonkel, & Habeck, 1983).

Current status of vegetation management within the action area

Current (1986) HNF and LCNF plans provide vegetation management guidance in a variety of forms. Both plans encourage the use of vegetation treatment, including prescribed fire, to improve habitat for various wildlife species and groups, and both plans include standards for maintaining hiding cover to benefit big game and other species. The GB Amendment that is incorporated into both plans includes guidance to reduce the risk of disturbance to bears during or as a result of vegetation management activities (PCA-NCDE-GDL-04, PCA-NCDE-GDL-07, and PCA-NCDE-GDL-08) and to maintain or increase habitat (PCA-NCDE-GDL-05) and cover (PCA-NCDE-GDL-06) where possible. Vegetation management projects must adhere to other grizzly bear related guidance, including standards regarding motorized route density where applicable, and adherence by contractors and other personnel to food storage orders.

Minerals and energy development

General effects of minerals and energy development on grizzly bears

Mineral development refers to surface and underground hardrock mining and coal production, which on NFS lands are regulated by permits. Oil and gas production are conducted through a leasing process. All these types of development have the potential to impact grizzly bears through construction and use of

motorized access routes (discussed in the Habitat Security section above), potential displacement from habitat and/or permanent habitat loss, potential for human-bear encounters and conflicts, and potential for food conditioning from exposure to food or attractants associated with minerals or energy operations (Northern Continental Divide Ecosystem Subcommittee, 2019).

Current status of minerals and energy development within the action area

Lands on the HLC NF are generally available for both locatable and leasable minerals exploration and development, with the exception of designated Wilderness areas, and areas that are either administratively or Congressionally withdrawn from those uses. Administratively withdrawn areas include such things as campgrounds, administrative sites, or other identified developed sites. The Elkhorns Wildlife Management Unit in the Elkhorns GA (Zone 2) is also administratively withdrawn from oil and gas leasing, but could be available for other types of leasable minerals exploration and development. The entire Rocky Mountain Range GA, which is entirely within the PCA, is withdrawn by act of Congress from future locatable or leasable minerals exploration or development.

Locatable mineral uses are managed through Plans of Operation and Notices of Intent that are developed at the time that specific plans for minerals exploration or development are submitted. The HLC NF averages roughly 30 active Plans of Operation or Notices of Intent in a given year, each of which generally disturbs less than one acre. The actual number active in any given year is changeable and generally dependent on the market price for the minerals of interest. The only commercial hardrock mining rights within the PCA on the HLC NF are for the Cotter Mine, on the Upper Blackfoot GA. There is currently no mining activity at that site.

There are two existing leases on the Rocky Mountain Range GA (PCA) that are currently suspended pending the outcome of litigation, eight lease parcels in the Big Belts GA (Zone 2) that are on hold (not yet leased) pending further review and decision, and one lease shared with the Custer-Gallatin NF in the Crazies GA (Zone 3) that is suspended. The Rocky Mountain Range GA, entirely within the PCA, is unavailable for future oil and gas exploration and development because of Congressional actions.

The existing LCNF plan includes guidance for oil and gas development in grizzly bear habitat that would constrain helicopter flights and seismic activity and guide other aspects of exploration and development to reduce the risk of negative impacts to grizzly bears. The GB Amendments include additional standards and guidelines to further reduce the potential for impacts to bears of mining, and oil and gas exploration and development. These include measures to reduce or mitigate potential impacts to bears (PCAZ1-NCDE-STD-05 through 10, PCAZ1-NCDE-GDL-02 and 03, PCAZ1-NCDE-GDL-05), require bear safety training for personnel involved in minerals and energy development activities (PCAZ1-NCDE-STD-11), and require no surface occupancy for new leases within the PCA (PCA-NCDE-STD-12).

These requirements and guidelines are focused on the PCA and zone 1, where management goals include recovering and sustaining recovery of the grizzly bear population. Plans for exploration for or development of minerals or oil and gas elsewhere on the HLC NF (e.g. in zones 2 and 3), should they occur, would currently be guided by site-specific analysis that would include consideration of wildlife, including grizzly bear habitat needs to the extent allowed by legal mineral rights.

Connectivity

General effects of connectivity on grizzly bears

Human activities such as roads and developments are the primary causes of grizzly bear habitat fragmentation (Servheen, Waller, & Sandstrom, 2001), which can limit grizzly bear movement within and among habitats, and has the potential to limit the degree to which grizzly bear populations in Montana and the U.S. are both genetically and demographically connected. Servheen and others (Servheen, Waller, & Sandstrom, 2003) found that fragmentation of grizzly bear habitat in Montana is largely associated with human development occurring on private lands in valley bottoms. They indicated that most public lands

had “minimal” or “low” potential for impact to grizzly bear habitat connectivity, although where public lands were not continuously distributed across the landscape, as in the checkerboard pattern of National Forest/private lands in some areas, the potential impact rose to “moderate”. Although their model did not consider habitat quality as an important factor governing bear movements, Mace and others (Mace, Waller, Manley, Ake, & Wittinger, 1999) documented strong associations between telemetry locations of radio-collared bears and certain broad categories of vegetation type. Effective ‘linkage zones’ between populations are areas that will support low density populations at certain times of year (Servheen et al., 2001); therefore, they must contain habitat elements necessary for the survival of those animals during that time period.

Kendall and others (Kendall et al., 2009) concluded that there are few geographical barriers to the movement of grizzly bears within the ecosystem, and that the NCDE grizzly bear population does not suffer from a lack of genetic diversity. Occupancy by grizzly bears of lands outside the NCDE is not identified as a recovery or management goal, but isolation of existing populations (USFWS, 1993) and the potential for ongoing fragmentation have been identified as concerns with respect to the health and recovery of grizzly bear populations in some ecosystems (USFWS, 2011). The Conservation Strategy for the Grizzly Bear in the NCDE notes that although connectivity to the west and south is not required for a healthy NCDE population, it would benefit other grizzly bear populations in the lower 48 states (Northern Continental Divide Ecosystem Subcommittee, 2019).

Current status and management of connectivity within the action area

The NCDE Conservation Strategy (Northern Continental Divide Ecosystem Subcommittee, 2019) identifies zone 2, which is entirely on the HLC NF and borders the south end of the NCDE, as having potential value for genetic connectivity between the NCDE and the GYE. Peck and others (Peck et al., 2017) support that conclusion, noting that the area including the Upper Blackfoot and Divide GAs (i.e. portions of Zones 1 and 2) and adjoining areas to the west may be more important to grizzly bears moving south from the NCDE to the GYE than the reverse. Largely because of existing blocks of HLC NF lands with few or no roads, such as inventoried roadless areas, the only management specific to Zone 2 called for in the NCDE Conservation Strategy and the GB Amendments is to reduce potential for grizzly bear-human conflict by implementing food storage orders (PCAZ1Z2-NCDE-STD-01). Food storage orders were implemented throughout this area beginning in 2018.

The portion of the NCDE Recovery Zone encompassing the action area includes large areas of designated wilderness areas and inventoried roadless areas, and as such is relatively unlikely to experience fragmentation due to human activities. As discussed in the sections above on habitat security and on recreation, over half (57%) of zone 1, nearly half (47%) of zone 2 and well over half (64%) of zone 3 is in designated wilderness, wilderness study area, or IRA. Table 6 in the Habitat Security section above displays the amount of each GBAU that is in potentially secure habitat (blocks $\geq$2500 acres that are $\geq$500m from any existing road). To sum that information in a way that reflects on the existing potential for connectivity within each area:

- Zone 1 : between 23 and 38 percent of each GBAU is in potentially secure habitat, with about 31% of the total NFS acreage in the zone in four blocks of potentially secure habitat, one of which is contiguous with a large block of secure habitat in Zone 2 (map available in project file).
- Zone 2: between 18 and 54 percent of each GBAU in zone 2 is potentially secure habitat with about 34% of the total NFS acreage in the zone in potentially secure habitat. Existing blocks of secure habitat are contiguous with secure habitat in Zone 1 and with public lands to the southwest and are well distributed throughout the GAs that comprise Zone 2.
- Zone 3: between 4 and 62 percent of each GBAU in zone 3 is potentially secure habitat, with roughly 34% of the total NFS acreage in the zone in potentially secure habitat. Existing blocks of secure habitat are distributed throughout most of Zone 3, with some contiguous with lands administered by the Custer-Gallatin National Forest in the Crazy Mountains.

Although effective genetic or demographic connectivity between and among areas is more complex than simply absence of roads or motorized travel, those measures provide the best index we have available to describe the potential for those areas to allow for movement of bears across the action area and between the NCDE and the GYE.

Ongoing consultation requirements

The HLC has several ongoing projects for which the respective U.S. Fish and Wildlife Service (USFWS) biological opinion terms and conditions and reporting requirements remain applicable (i.e. the projects have not yet been fully implemented). Some of these projects are programmatic in nature such as travel planning and the continued implementation of the 1986 Helena National Forest Plan as amended by the Grizzly Bear Amendment. Other projects are site-specific with the respective consultation tiered to one or more programmatic BO. Although not all of these ongoing projects are specific to the Forest Plan revision efforts, they (and associated biological opinion requirements) are part of the existing condition. These are included here in order to consolidate where applicable the terms and conditions/reporting requirements of those respective BOs into the BO for the 2020 Forest Plan. Following is a brief synopsis of each 'ongoing' biological opinion and the project status. See the respective Biological Opinion for more information.

USFWS Biological Opinion on the Effects of the Blackfoot-North Divide Winter Travel Plan (Blackfoot Winter Travel Plan) on Grizzly Bears, 2010

The USFWS delivered their biological opinion on the effects of winter travel planning on grizzly bears on July 22, 2010 (U.S. Department of the Interior, Fish and Wildlife Service, 2010). Specifically, the USFWS concluded that the incidental take associated with permitted snowmobile use would not result in jeopardy to grizzly bears. The USFWS provided several terms and conditions to be followed in order to comply with the reasonable and prudent measures to: (1) ensure snowmobile use is quantified and monitored in a consistent and predictable way to reassess, if necessary, the assumptions in this biological opinion; and (2) ensure adequate protection to known and potential grizzly bear den sites and post-emergent females with cubs (U.S. Department of the Interior, Fish and Wildlife Service, 2010).

Implementation of Blackfoot Winter Travel Plan will continue as planned under the 2020 Forest Plan; in other words, the revised plan will not supersede the Blackfoot Winter Travel Plan Decision.

USFWS Biological Opinion on the Effects of the Helena National Forest Plan on Grizzly Bears, 2014

In its biological opinion on the effects of the 1986 Helena National Forest Plan on grizzly bears (U.S. Department of the Interior, Fish and Wildlife Service, 2014b), the USFWS concluded that the continued implementation of the 1986 Helena Forest Plan in the expanded Distribution Zone was not likely to jeopardize the continued existence of the grizzly bear. The USFWS included a number of non-discretionary terms and conditions with which the Forest must comply in order to "[r]educe the potential for mortality and displacement of grizzly bears on the Forest, both inside and outside the NCDE" (U.S. Department of the Interior, Fish and Wildlife Service, 2014b).

The 2020 Forest Plan will supersede the 1986 Helena National Forest Plan for which this Biological Opinion was rendered.

USFWS Biological Opinion on the Effects of the Divide Travel Plan on Grizzly Bears, 2016

The USFWS concluded in its biological opinion on the effects of the Divide Travel Plan on grizzly bears (U.S. Department of Interior, 2016b) that implementation of the Divide Travel Plan was not likely to jeopardize the continued existence of the grizzly bear. The USFWS provided a number of non-discretionary terms and conditions with which the Forest must comply in order to "[r]educe the potential for displacement of grizzly bears within the action area" (U.S. Department of Interior, 2016b).

Implementation of Divide Travel Plan will continue as planned under the revised plan; in other words, the revised plan will not supersede the Divide Travel Plan Decision.

USFWS Biological Opinion on the Effects of the Blackfoot Non-Winter Travel Plan on Grizzly Bears, 2016

The USFWS delivered their Biological Opinion on the effects of the Blackfoot Non-Winter Travel Planning on grizzly bears on August 3, 2016 (U.S. Department of the Interior, Fish and Wildlife Service, 2016a). The USFWS provided several terms and conditions to be followed in order to comply with the reasonable and prudent measure to "[r]educe the potential for displacement of grizzly bears" (U.S. Department of the Interior, Fish and Wildlife Service, 2016a).

Implementation of Blackfoot Non-Winter Travel Plan will continue as planned under the revised plan; in other words, the revised plan will not supersede the Blackfoot Non-Winter Travel Plan Decision.

USFWS Second-Tier Consultation for the Stonewall Vegetation Project (Stonewall Project), 2016

The USFWS tiered their August 24, 2016 consultation for the Stonewall Project (U.S. Department of Interior, 2016a) to the 2016 'Biological Opinion on the Effects of the Blackfoot Non-Winter Travel Plan on Grizzly Bears'(U.S. Department of the Interior, Fish and Wildlife Service, 2016a). They determined that other than effects associated with access (temporary road construction) project activities would not adversely affect grizzly bears. They also concluded that project effects associated with temporary road construction were consistent with the 2016 biological opinion for the Blackfoot Non-Winter Travel Plan. The USFWS determined that the Stonewall Project was not likely to jeopardize the continued existence of grizzly bears (U.S. Department of Interior, 2016a).

Implementation of Stonewall Project will continue as planned under the revised plan; in other words, the revised plan will not supersede the Stonewall Project.

USFWS Second-Tier Consultation for the Telegraph Vegetation Project (Telegraph Project), 2017

The USFWS tiered their January 4, 2017 consultation for the Telegraph Project (U.S. Department of Interior, 2017b) to the 2014 'Biological Opinion on the Effects of the Helena National Forest Plan on Grizzly Bears' (U.S. Department of the Interior, Fish and Wildlife Service, 2014b) and the 2016 'Biological Opinion on the Effects of the Divide Travel Plan on Grizzly Bears' (U.S. Department of Interior, 2016b). They concluded that other than effects associated with access (ongoing access conditions and temporary road construction associated with the project) none of the project activities were likely to adversely affect grizzly bears. The USFWS further concluded that project effects related to ongoing access conditions and temporary road construction were adequately analyzed in the 2014 and 2016 biological opinions. They determined that the Telegraph Vegetation Project was not likely to jeopardize the continued existence of grizzly bears (U.S. Department of Interior, 2017b).

Implementation of Telegraph Project will continue as planned under the revised plan; in other words, the revised plan will not supersede the Telegraph Project.

USFWS Biological Opinion on the Effects of the Grizzly Bear Amendment on Grizzly Bears, 2017

In its biological opinion on the effects of the Grizzly Bear Amendment on grizzly bears (U.S. Department of Interior, 2017a), the USFWS concluded that the Grizzly Bear Amendment was not likely to jeopardize the continued existence of the grizzly bear. The USFWS included a number of non-discretionary terms and conditions in order to "[m]inimize or reduce the potential for project-related mortality and displacement of grizzly bears" (U.S. Department of Interior, 2017a).

The 2020 Forest Plan will supersede the Grizzly Bear Amendment for which this Biological Opinion was rendered. The 2020 Forest Plan will retain in its entirety the Grizzly Bear Amendment. This is explained in detail further in this BA in the 'Environmental Consequences' section.

USFWS Second-Tier Consultation for the Tenmile South Helena Vegetation Project (Tenmile Project), 2018

The USFWS tiered their December 19, 2018 consultation for the Tenmile project (U.S. Department of Interior, 2018) to the 2014 'Biological Opinion on the Effects of the Helena National Forest Plan on Grizzly Bears' (U.S. Department of the Interior, Fish and Wildlife Service, 2014b) and the 2016 'Biological Opinion on the Effects of the Divide Travel Plan on Grizzly Bears' (U.S. Department of Interior, 2016b). While the USFWS determined that the effects associated with baseline access conditions as well as temporary road construction were adequately analyzed in the 2014 and 2016 biological opinions, they concluded that the use of closed roads for project activities in addition to the temporary road construction would impart additional adverse effects not covered in those programmatic biological opinion. As a result, the USFWS provided several terms and conditions to be followed in order to comply with the reasonable and prudent measure to "[r]educe the potential for harm caused by displacement of grizzly bears" (U.S. Department of Interior, 2018). The USFWS concluded that the Tenmile South Helena project was not likely to jeopardize the continued existence of grizzly bears (U.S. Department of Interior, 2018).

Implementation of Tenmile Project will continue as planned under the revised plan; in other words, the revised plan will not supersede the Tenmile Project.

USFWS Second-Tier Consultation for the Willow Vegetation Project (Willow Project), 2019

The USFWS tiered their April 8, 2019 consultation for the Willow Project (U.S. Department of Interior, 2019a) to the 2016 'Biological Opinion on the Effects of the Blackfoot Non-Winter Travel Plan on Grizzly Bears' (U.S. Department of the Interior, Fish and Wildlife Service, 2016a). They determined that other than effects associated with access (temporary road construction) project activities would not adversely affect grizzly bears. They also concluded that project effects associated with temporary road construction were consistent with the 2016 biological opinion for the Blackfoot Non-Winter Travel Plan. The USFWS determined that the Willow Project was not likely to jeopardize the continued existence of grizzly bears (U.S. Department of Interior, 2019a).

Implementation of Willow Project will continue as planned under the revised plan; in other words, the revised plan will not supersede the Willow Project.

USFWS Second-Tier Consultation for the Wassen Vegetation Project (Wassen Project), 2019

As with the Willow Project, the USFWS tiered their November 27, 2019 consultation for the Wassen Project (U.S. Department of Interior, 2019b) to the 2016 'Biological Opinion on the Effects of the Blackfoot Non-Winter Travel Plan on Grizzly Bears' (U.S. Department of the Interior, Fish and Wildlife Service, 2016a). They determined that other than effects associated with access (use of existing road system) project activities were not likely to adversely affect grizzly bears. They concluded that the existing access conditions and road use for project activities was consistent with their analysis of effects to grizzly bears in the 2016 biological opinion. There were no changes to road management associated with the Wassen project. The USFWS determined that the Wassen Project was not likely to jeopardize the continued existence of grizzly bears (U.S. Department of Interior, 2019b).

Implementation of Wassen Project will continue as planned under the revised plan; in other words, the revised plan will not supersede the Wassen Project.

Environmental consequences

Analysis approach

The proposed action is a framework programmatic decision that does not directly authorize any action. Rather, it establishes the sideboards for allowable activities throughout the life of the plan. In other words, the Forest Plan represents the set of rules by which future actions are subsequently planned. As such, there would be no direct nor specific environmental consequences associated with the proposed action. Analysis of the effects of this programmatic action therefore is based on the potential effects of implementing an overarching management program as a whole and is necessarily broad in its approach. Direct effects to grizzly bears, to their habitat, or to other resources, can only be predicted when specific project proposals are developed. Analysis and consultation for site specific actions will occur when those projects are planned and proposed.

This BA addresses those factors that are affected by management on NFS lands, as guided by the programmatic direction in Forest Plans: food/attractant management, habitat security/motorized access, developed recreation, other recreational activity including hunting, connectivity, livestock grazing, vegetation management, and minerals and energy uses. A brief discussion of the specific risk factors, and summary of current management direction and status of each risk factor was provided in the Existing Condition section above. Effects to grizzly bears and their habitat resulting from the proposed action and preferred alternative are described here following the same organization based on those identified risk factors.

Summary of plan content

The 2020 Forest Plan identifies allowable uses by establishing desired conditions for certain uses. This is done by identifying suitability of certain areas for certain uses, and by designating certain areas where specific uses are to be emphasized or restricted. Table 11 shows uses allowed in the 2020 Forest Plan, Alternative F, for the combined HLC NF. As noted in the section titled “Description of the Preferred Alternative – Alternative F” at the beginning of this document, Table 11 shows the maximum area in which those uses could be allowed, but actual acreage where uses occur is much smaller and is determined through project planning and site-specific analysis.

Table 11. Allowable uses under the preferred alternative

Allowable uses under the preferred alternative	Total acres
Land suitable for timber production[1]	368,814
Land unsuitable for timber production but where harvest[2] may occur	1,673,853
Personal use of forest products	2,874,356
Commercial use of forest products	2,037,261
Recommended Wilderness	153,136
Eligible Wild and Scenic Rivers	361 miles
Research Natural Areas	18,447
Green Timber Botanical Area	1,167
Badger Two Medicine Special Area	129,740
Experimental and demonstration forests	8,871
Recreation Emphasis Areas	89,439
Grazing allotments	1,355,143
Riparian Management Zones	496,212
Wheeled motorized vehicle use (spring-summer-fall)	1,098,892
Over-snow motorized use (winter)	1,875,187

Allowable uses under the preferred alternative	Total acres
Summer non-motorized	1,784,322
Winter non-motorized	1,875,187

[1] Timber production is 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).
[2] Timber harvest is the removal of trees for wood fiber use and other multiple-use purposes (36 CFR 219.9)

The 2020 Forest Plan includes desired conditions for various uses and resources and establishes constraints on uses and activities to help achieve or move toward desired conditions. The 2020 Forest Plan also includes some plan components that are specific to GAs (refer to Figure 1 in the Introduction to this document), which are defined landscapes with identifiable characteristics. Forestwide plan components are applied on all GAs and are only superseded by GA-specific components if the GA components specifically state that is the case. Refer to the section titled "Description of the Preferred Alternative – Alternative F" at the beginning of this document for more detail regarding the proposed action and refer to Appendix A of this document for the full content of the 2020 Forest Plan.

The proposed action incorporates in their entirety the "Amendments to incorporate habitat management direction for the NCDE grizzly bear population into the Helena, Lewis and Clark, Kootenai, and Lolo National Forest Plans", referred to here as the GB Amendments (U.S. Department of Agriculture, Forest Service, 2018a) . The desired conditions, objectives, goals, standards, and guidelines are incorporated directly into the HLC NF revised plan, retaining an 'NCDE' identifier. The BA (Warren, Kuennen, Eimeren, & Treschsel, 2017) for the amendments provided detailed analysis of the potential impacts of implementing the management direction in the amendments, and determined that implementing the amendments may affect, and is likely to adversely affect the grizzly bear. In its Biological Opinion (U.S. Department of the Interior, Fish and Wildlife Service, 2017a), the FWS concluded that implementation of the amendments were not likely to jeopardize the continued existence of the grizzly bear.

In addition to the direction in the GB Amendments, the revised plan includes guidance both directly and indirectly related to management of grizzly bears and their habitat. Plan components from the GB Amendments provide for management of grizzly bear habitat based on management zone (PCA and zones 1, 2, and 3). These plan components contain the acronym 'NCDE' in their identifier and remain exactly the same as in the GB Amendments. Other plan components apply either forestwide or in specific GAs and will be discussed as such.

Effects of the proposed action on factors affecting grizzly bears in the action area

Food and attractant management

Several plan components require or support requirements for managing food and attractants to minimize risk of bears becoming food conditioned:

- FW-NCDE-STD-02: Special-use permits for apiaries (beehives) located on NFS lands shall incorporate measures including electric fencing to reduce the risk of grizzly bear-human conflicts, as specified in the food/wildlife attractant storage special order.
- PCAZ1Z2-NCDE-STD-01: Within the NCDE primary conservation area, zone 1, and zone 2, food/wildlife attractant storage special order(s) shall apply to NFS lands.
- PCAZ1Z2-NCDE-ST-02: Within the NCDE primary conservation area, zone 1, and zone 2, if a contractor, permittee, lessee, or operator or their employees elect to camp on NFS lands other than in a developed recreation site, the site should be evaluated and written authorization (i.e., a campsite agreement that includes the food/wildlife attractant storage special order) should be provided before the campsite is established. The purpose is to reduce the risk of grizzly bear-human conflicts.

- PCAZ1-NCDE-STD-01: Within the NCDE primary conservation area and zone 1, new or reauthorized livestock grazing permits and annual operating plans shall incorporate requirements to reduce the risk of grizzly bear-human conflicts (e.g., a food/wildlife attractant storage special order). New or reauthorized permits shall include a clause providing for modification, cancellation, suspension, or temporary cessation of activities, if needed, to resolve a grizzly bear-human conflict situation.
- PCAZ1-NCDE-STD-02: Within the NCDE primary conservation area and zone 1, permits for livestock grazing shall include a provision that requires the reporting of livestock carcasses within 24 hours of discovery, which shall be followed by proper disposal of the carcass. Boneyards shall not be established on NFS lands.
- PCAZ1-NCDE-STD-08: Within the NCDE primary conservation area and zone 1, in addition to measures included in the food/wildlife attractant special order(s), new plans of operation, permits, and/or leases for mineral activities shall include the [additional] measures regarding grizzly bear attractants [see plan text for additional details].
- PCAZ1-NCDE-GDL-01: Within the NCDE primary conservation area and zone 1, clover should not be used in seed mixes on NFS lands. Native seed mixes or those that are less palatable to grizzly bears should be used so that seeded areas do not become an attractant.

The plan components listed above include not only implementation of food and attractant storage requirements, but also additional measures to ensure that permittees using NFS lands adhere to those orders and in some circumstances take additional steps to minimize the risk of bear-human conflicts. Proper storage and management of food and attractants has been demonstrated to be an effective tool to reduce grizzly bear mortality risk (Northern Continental Divide Ecosystem Subcommittee, 2019). The effect to grizzly bears of the above plan components would be to continue or decrease the existing relatively low risk of bears becoming food-conditioned or of conflicts developing as a result of human foods or attractants on NFS lands managed under the HLC NF 2020 Forest Plan.

Habitat security and motorized access management

Summer motorized access management

The mileage, location, and timing of public motorized travel across the HLC NF is determined by travel plans, which are in place across the HLC NF, and will not change as a result of the programmatic direction in the proposed action. Table 5 in the Existing Condition section above displays the status of motorized route densities in the PCA and zone 1, where reporting of open and total motorized route densities is carried out according to requirements and methodologies described in the GB Amendments. Those requirements are carried forward into the proposed action:

- PCA-NCDE-STD-03: In each bear management subunit within the NCDE primary conservation area, there shall be no net decrease to the baseline … for secure core and no net increase to the baseline for open motorized route density or total motorized route density on NFS lands during the non-denning season …(see Appendix A for remaining explanatory text).
- Z1-NCDE-STD-01: Within zone 1 on the Helena-Lewis and Clark National Forest …, there shall be no net increase above the baseline in density of motorized routes (roads and trails) open to public motorized use during the non-denning season on NFS lands. Open motorized route density is calculated by dividing the total miles of open motorized routes on NFS lands in zone 1 by the total square miles of NFS land area in that same area…(see Appendix A for remaining explanatory text).

Open and total motorized route densities and secure core would continue to be calculated according to established methods, and changes allowed to the baseline only for specific reasons that include improved data or measurement technology, minor to address resource issues or safety or enforcement, use for emergency situations, or changes in land ownership (see Appendix A for details).

The plan establishes objectives for vegetation management (timber harvest, fuels treatments, etc.) that could require temporary use of existing motorized routes that are currently closed, or construction of new temporary motorized routes in order to allow implementation of those vegetation management activities. Within the PCA, the following plan components would apply to the use of temporary routes for project implementation:

- PCA-NCDE-STD-01: In each bear management subunit within the NCDE primary conservation area, temporary changes in the open motorized route density, total motorized route density, and secure core shall be calculated for roads used for projects (as defined by "project (in grizzly bear habitat in the NCDE)") during the non-denning season (see glossary). Calculations will include estimated changes for each year of the anticipated duration of the project and shall be incorporated into the 10-year running average required by standard NCDE-STD-AR-03.
- PCA-NCDE-STD-02: Within the NCDE primary conservation area, motorized use of roads with public restrictions shall be permitted for administrative use (see glossary) as long as doing so does not exceed either six trips (three round trips) per week or one 30-day unlimited use period during the non-denning season (see glossary). The exception to this standard is:
    - Emergency situations as defined by 36 Code of Federal Regulations (CFR) 218.21.
    - Note: Administrative use is not included in baseline calculations and is not included in calculations of net increases or decreases. If the level of administrative use exceeds this standard, the use is counted as a project (see "project (in grizzly bear habitat in the NCDE)" in the glossary).

In Zone 1, standard Z1-NCDE-STD-01 requires no net increase in the baseline density of motorized routes, as described above, but it does not apply to several situations (refer to Appendix A and to the 2020 Forest Plan for details), including temporary roads.

The last 8 years of vegetation management projects in Zones 1-3 involved 98 miles of temporary roads, with all but 4 miles occurring outside mapped secure habitat areas. Based on analysis of those projects, we estimate that secure habitat as currently measured could be temporarily affected by an average of 2.5%, and no more than 7% in any individual GBAU over the anticipated life of the plan (assumed to be 15 years), as a result of temporary motorized routes used to implement vegetation management projects. Temporary reduction in effectiveness of secure habitat occurring during implementation of these projects would likely occur in no more than 6 GBAUs in total during that time, and likely in no more than 2 GBAUs concurrently. The minor reductions in the effectiveness of secure habitat would be localized and likely in widely separate areas but could result in minor disturbance or displacement of bears using those areas during project implementation time periods.

It is possible that temporary routes used for vegetation management could affect polygons of secure habitat so that the effective size of a secure habitat polygon is less than 2500 acres during project implementation. As discussed in the Existing Condition section above, the method we are currently using to estimate potentially secure habitat likely underestimates the amount of secure habitat that is actually present on the HLC NF. Therefore, it is possible that some secure habitat polygons may in fact be larger than we estimated and may continue to provide habitat security for grizzly bears despite the influence of temporary roads in some portions of them.

Our analysis showed that most temporary roads tend to occur in proximity to existing motorized routes and not within 500m of mapped secure habitat patches. The effects of those temporary routes would likely not be separate or distinguishable from the effects of existing motorized routes already on the landscape, as discussed in the Existing Condition.

We anticipate that up to 15 miles of permanent roads could be constructed across the Forest over the life of the plan (assuming 15 years). This estimate is based on the assumption that the Forest could construct up to 1 mile of permanent road per year. This estimate is also based on the fact that the Forest has built

very few permanent roads over the last several years. Permanent road construction within grizzly bear subunits in the PCA and Zone 1 is limited by the aforementioned standards such that changes to secure core in the PCA are precluded and changes to secure habitat in GBAUs in Zone 1 are unlikely. In GBAUs elsewhere across the Forest new permanent roads are likely to replace old roads that would subsequently be obliterated; in other words, it's likely in most situations that new permanent road construction would not result in a net increase in permanent road miles. Meanwhile, existing roads that are no longer needed would continue to be removed from the landscape so it's likely that we would see a decrease in miles of permanent roads over the life of the plan.

As discussed in the Existing Condition section above, the method we are currently using to estimate potentially secure habitat likely underestimates the amount of secure habitat that is actually present on the HLC NF. That means that some areas where temporary routes might be used over the life of the plan or where permanent roads might be constructed could currently be functioning as secure habitat although we did not identify them as such.

Other plan components in the proposed action related specifically to the transportation system are:

- FW-RT-DC 02, FW-RT-OBJ 01 and FW-RT-GDL-12 state that roads that are not needed to serve administrative and public needs are not present, and guide managers to decommission at least 50 miles of roads over the life of the plan, to address resource damage and to benefit fish and wildlife habitat, enhance the desired recreation opportunity spectrum settings and opportunities, and/or create a more cost-efficient transportation system.
- FW-RT-GDL-13 guides managers to avoid building roads in key seasonal wildlife habitats, which includes grizzly bear spring habitat. Therefore, the risk of disturbance or displacement of grizzly bears from spring habitats as a result of new permanent or temporary road construction and use would be less than in summer and fall habitats.
- FW-RT-DC 04 Sets a desired condition for the transportation system to have minimal impacts on resources including all wildlife, heritage and cultural sites, water quality, and aquatic species.
- FW-ACCESS-GDL-01 adds to the plan components discussed above by guiding managers to rehabilitate unauthorized recreation routes and restore landscapes to natural conditions.

Secure habitat could increase on the HLC NF based on the above plan components that set objectives for and otherwise guide managers to decommission roads that are not used. The specific roads to be decommissioned are not identified in the proposed action, so we cannot quantitatively predict the potential effects of decommissioning on secure habitat or on specific secure habitat areas until specific proposals are developed.

The effects of motorized route access and of secure habitat in areas where grizzly bears may be present but have not been documented on a recurring basis are difficult to predict. For some period of years during the life of the proposed plan, bears using portions of zones 2 and 3 are likely to have traversed large expanses of human-dominated areas in order to reach NFS lands in those areas. In doing so those individuals may have learned either avoidance or tolerance of human activities. Individual bears moving into areas new to them are likely to initially be naïve to the availability and distribution of food sources, hazards, and secure habitat. Grizzly bears establishing home ranges in areas with few or no other established bears presumably have different choices available to them regarding use or avoidance of areas with motorized routes or other human uses than do bears using areas where other bears are already established. We anticipate that, in general, motorized routes have the potential to disturb or displace individual bears, or to increase risk of conflicts or mortality, and the availability of secure habitat has the potential to reduce those adverse effects. We cannot, however, assume that thresholds or values for motorized route density and secure habitat derived from and used to analyze effects to bears in areas that have established populations would apply in areas that do not.

The methods for identifying and quantifying secure habitat for GBAUs in zones 1-3 are somewhat different from those used to identify and quantify secure core reported for Subunits in the PCA. The methods and databases used are different between the PCA and elsewhere. The reference quantity for secure core in the PCA is based on research in the recovery zone, and on what may be required within a female home range for the purpose of recovering the population, rather than as a threshold of secure habitat for determining individual adverse effect in an area outside the recovery zone/PCA. Nevertheless, the effect of secure habitat as identified in zones 1-3 and of secure core in the PCA is assumed to be largely similar, providing areas where grizzly bears are be less likely to be disturbed or displaced or otherwise affected by human activities, particularly by motorized travel and the access it provides into habitats used by bears.

The effects to bears in the PCA and Zone 1 of the plan components retained from the GB Amendments would be as described in the BA (Warren et al., 2017) for those amendments: some adverse effects possible to individual bears in areas of relatively high motorized route densities or where temporary roads are constructed or used.

In Zones 2 and 3 the presence of the existing motorized travel system may have adverse impacts to individual bears, particularly in areas of higher route density or in GBAUs with relatively low proportions of secure habitat (e.g. Boulder River, South Big Belts, Sheep Creek, and Castles, all of which have less than 50% of their area currently estimated as secure habitat). The consequences of relatively low amounts of secure habitat in some GBAUs depend on habitat type, topography, presence of other grizzly bears, and the type and amount of various human uses in and adjacent to those areas.

Winter motorized over-snow travel

The mileage, acreage, location, and timing of winter motorized over-snow travel across the HLC NF is determined by travel plans, which are in place across the HLC NF and would not change as a result of the programmatic direction in the proposed action. The amount and timing of motorized over-snow travel described in the Existing Condition would remain the same under the proposed action. The plan component for the PCA displayed in the Existing Condition above would be included unchanged in the proposed action as PCA-NCDE-STD-09.

The effects to grizzly bears of winter motorized over-snow travel on the HLC NF are likely to be minimal. As discussed in the Existing Condition, there is little evidence that over-snow motorized travel affects choice of denning location or causes negative impacts to bears during the den emergence timeframe. Nevertheless, there is some potential for grizzly bears to experience adverse effects from late-season over-snow motorized vehicle use in some areas, particularly where such use is allowed after March 31. Bears using those areas could experience disturbance at a time when their body condition is poor and food resources are limited.

Over-snow-motorized use is allowed after March 31 across the Forest with the exception of most of the PCA within which over-snow-motorized use is not allowed after March 31. Snowmobile use past March 31 in the PCA is allowed in the Copper Bowls area in the Upper Blackfoot through May 31. See the Winter Motorized Travel section in the Existing Condition for more details.

Other indicators of habitat security

Area designations made by law would not change under the proposed action. Therefore the amount of designated wilderness, wilderness study area, and inventoried roadless area will remain the same as displayed in Table 7 in the Existing Condition. Plan components for those designations in the proposed action related to motorized access and security are summarized below, with full text and details available in Appendix A:

- FW-WILD-DC 03 establishes the desired condition that large remote areas within designated wilderness areas contribute habitats for species with large home ranges such as wide-ranging

carnivores (e.g., grizzly bear), and that habitat in wilderness contributes to wildlife movement within and across the Forest. FW-WILD-SUIT 02 states that these areas are not suitable for motorized uses or mechanized means of transport.

- FW-WSA-SUIT-04 and 08 state that wilderness study areas are suitable for motorized and mechanized uses, subject to travel plans or other designations, but FW-WSA-SUIT-05 states that new road construction or reconstruction is not suitable in wilderness study areas.
- FW-IRA-DC 01 establishes the desired condition that roadless areas provide large, undisturbed, and unfragmented areas of land and provide for secure habitats for a variety of fish and wildlife species that are dependent upon those conditions. Motorized routes that are managed as part of the existing forest transportation system are suitable in inventoried roadless areas (FW-IRA-SUIT 02).

Forest Plans establish recommended wilderness areas, which are to be managed to retain characteristics that would allow them to become designated wilderness in the future, should Congress decide to do so. Table 12 displays the amount of recommended wilderness in the 2020 Forest Plan as compared to that in the existing (1986) plans (see also Table 8 above).

Table 12. Acreage of habitat by Grizzly Bear Analysis Unit (GBAU), and percent of total NFS lands in GBAUs that are in recommended wilderness area in the proposed action and in existing (1986) Forest Plans

Grizzly bear management zone	Geographic area	Grizzly Bear Analysis Unit (GBAU)	Total NF acres in GBAU	EXISTING acres (%) of GBAU in recommended wilderness area	PROPOSED acres (%) of GBAU in recommended wilderness area
Zone 1	Upper Blackfoot	Dalton Mountain	82,277	0	17,133 (21%)
Zone 2	Divide	Spotted Dog	66,723	16, 653 (25%)	18,239 (27%)
	Big Belts	North Big Belts	171,431	9,105 (5%)	7,032 (4%)
		South Big Belts	67,118	8,420 (13%)	8,141 (12%)
Totals	na	na	na	34,178	50,545

The 2020 Forest Plan identifies 50,545 acres of recommended wilderness within the area where grizzly bears currently may be present. This is approximately 16,367 more acres (a roughly 48% increase) than in the existing (1986) plans (Table 12). The proposed action also includes a recommended wilderness area of roughly 66,894 acres not shown in Table 12, because it occurs in the Big Snowy Mountains in the Snowies GA, which is outside both zone 3 and the current area identified where grizzlies may be present. Motorized travel would not be allowed in recommended wilderness areas (see FW-RECWILD-SUIT 01 below). These areas largely overlap with existing inventoried roadless areas, and in the Snowies GA largely overlaps with the Congressionally designated wilderness study area.

Plan components related to secure habitat in recommended wilderness areas in the proposed action include:

- FW-RECWILD-SUIT 01 prohibits motorized and mechanized means of transport except for authorized permitted uses, specified valid existing uses (e.g. access to private inholdings), or in emergencies.
- FW-RECWILD-SUIT 04 and 05 state that recommended wilderness areas are not suitable for timber production or timber harvest or for road construction or reconstruction.

These plan components mean that in secure habitat patches that overlap with recommended wilderness areas, there would be no vegetation management projects using temporary motorized access.

The combined effect of designated wilderness, wilderness study areas, inventoried roadless areas, and recommended wilderness areas would be to maintain those acreages as largely secure habitat and increase potential long-term security in areas designated as recommended wilderness areas. These areas may limit or reduce the potential for bears to experience disturbance or displacement or be involved in bear-human conflicts as a result of certain types of human uses.

The proposed action includes other plan components that could influence motorized access and habitat security in the action area. These are summarized below for ease of discussion; the full text of plan components is found in Appendix A.

The proposed action includes plan components relating to providing and managing motorized access for a variety of uses:

- FW-ACCESS-DC 01, 03 and 04 establish desired conditions to provide motorized access to recreation opportunities, and motorized travel as a form of recreation in appropriate settings.
- FW-LAND USE-DC 02, FW-LAND USE-GDL 01 provide desired conditions and guidance for lands special uses requiring roads or other infrastructure, including access to private inholdings.
- FW-RT-DC 01 and FW-RT-DC 03 establishing desired conditions for a safe and effective transportation system that provides access opportunities for people to use NFS lands.
- FW-RT-OBJ-02 calls for completing at least 100 miles of reconstruction or road improvement projects, with priorities on those that may be impacting aquatic and riparian systems.

Desired conditions that feature motorized travel to and on NFS lands the proposed action create the possibility of adverse effects to individual bears as a result of motorized travel. Those effects are described in the Existing Condition section, and include the potential for disturbance, displacement, and direct and indirect mortality.

The proposed plan also includes components relating to management of the transportation system and motorized access in order to limit impacts to a variety of resources, including grizzly bears:

- FW-WL-DC-04 is a desired condition for large, unroaded areas to be distributed and connected forestwide, providing for species with large home ranges that also require seclusion or low levels of disturbance by humans.
- FW-RT-DC-04 states the desired condition that the transportation system has minimal impact on various resources, including wildlife, and FW-RT-GO-03 supports coordination to implement wildlife highway crossings.
- In the Elkhorns GA (zone 2, including the Casey Peak, Crow Creek, and Boulder River BDNF GBAUs) EH-ACCESS-GDL-01 guides managers to use location and timing restrictions to minimize impacts to wildlife from access to inholdings, EH-RT-STD-01 limits new permanent road-building in the Elkhorns GA to only that needed for alleviating resource concerns, and EH-RT-STD-02 prohibits construction of a road bisecting the mountain range.
- In the Rocky Mountain Range GA (PCA), RM-CMA-DC-03, RM-CMA-STD-01, and RM-CMA-STD-02 identify nonmotorized travel as appropriate in the Rocky Mountain Front Conservation Management Area, and limit motorized travel to existing motorized routes, with prohibitions on building new permanent roads and limits on construction and use of temporary roads.

The effects of these plan components would be to promote the establishment or retention of large expanses of unroaded area, which would continue to provide potentially secure habitat. The focus of a number of plan components on minimizing impacts of the transportation system and its use on other resources, on limiting new road construction, and on decommissioning unneeded and unauthorized routes would all have the effect of limiting or reducing the potential adverse effects to grizzly bears of motorized

travel. Limits on new road construction and objectives to decommission roads would maintain or increase secure habitat.

Developed sites

The plan includes desired conditions to have developed recreation sites and facilities as follows (refer to the 2020 Forest Plan components in Appendix A for complete wording):

- FW-REC-DC-03 Sustainable levels of developed recreation sites … exist … to accommodate concentrations of recreation use.
- FW-REC-DC-04 Recreation facilities and their use have minimal impacts on resources including at-risk species
- FW-REC-GDL 01 Management of developed recreation facilities should be responsive to environmental changes such as … wildlife habitats
- FW-REC-GDL-07 guides managers to avoid using seed mixes or other vegetation plantings that could attract bears to roads and developed sites.
- PCA-NCDE-STD-06 limits the number and capacity of developed recreation sites on NFS lands that are designated and managed for overnight use by the public during the non-denning season to one increase above the baseline per decade per BMU in the PCA (same as NCDE-STD-AR 05 in the GB Amendment).

The 2020 Forest Plan also includes forestwide components to rehabilitate or relocate developed recreation sites or facilities that are having negative impacts on other resources (e.g., FW-REC-OBJ-01 and 02), but also includes guidance to refurbish developed sites to meet current and future demands (FW-REC-OBJ-04).

The 2020 Forest Plan affirms the desire to accommodate recreational activities on the HLC NF that depend on developed sites and facilities and provides direction for management of those sites. The presence of developed sites, particularly those that experience frequent, prolonged, or overnight use may increase the risk of human-bear interaction or conflict largely through the presence of human foods and other attractants. Although food storage orders are in place across the HLC NF, the presence of attractants could bring bears into proximity with humans and increase the risk of interaction and potential conflict. Bears may avoid areas with concentrations of human activity, such as developed recreation sites, which could result in displacement from some habitats. Developed recreation sites are also often associated with other recreational activities (see next section), that could have impacts to bears or their habitat. The standards listed above that guide managers to minimize impacts to wildlife and that limit increases in overnight developed site number and capacity in the PCA would reduce the potential for conflicts forestwide and would limit the overall potential for impacts, including displacement, in the PCA. Nevertheless, the presence of over 200 developed recreation sites on the HLC NF creates potential for adverse impacts to individual bears through potential conflict or displacement.

Recreational activities

Table 13 displays the acreage of each ROS by GA under the 2020 Forest Plan. Only NFS lands are included here because any intervening private or other non-NFS lands may have different characteristics than the adjacent or surrounding NFS lands.

Table 13. Acreage of recreation opportunity setting by GA, 2020 Forest Plan, alternative F

GA	TOTAL GA acres (NFS lands only)	Primitive acres (% of GA)	Semi primitive nonmotorized acres (% of GA)	Semi primitive motorized acres (% of GA)	Roaded natural acres (% of GA)	Rural acres (% of GA)
Big Belts	315,199	46,031 (15%)	107,915 (34%)	39,021 (12%)	112,531 (36%)	9,700 (3%)
Castles	69,709	0	16,876 (24%)	16,343 (23%)	36,490 (52%)	0
Crazies	57,667	0	33,899 (59%)	15,126 (26%)	8,642 (15%)	0
Divide	202,642	32,953 (16%)	69,126 (34%)	22,457 (11%)	69,298 (34%)	8,808 (4%)
Elkhorns	161,251	45,894 (28%)	48,699 (30%)	6,450 (4%)	57,342 (36%)	2,853 (2%)
Highwoods	42,291	0	29,906 (71%)	8,219 (19%)	4,165 (10%)	0
Little Belts	804,657	101,382 (13%)	189,391 (24%)	221,916 (28%)	288,729 (36%)	3,239 (<1%)
Rocky Mountains	778,023	578,357 (74%)	144,091 (19%)	24,553 (3%)	27,796 (4%)	3,226 (<1%)
Snowies	118,172	95,628 (81%)	0	6,541 (6%)	15,328 (13%)	676 (1%)
Upper Blackfoot	333,617	134,429 (40%)	109,744 (33%)	15,240 (5%)	73,723 (22%)	481 (<1%)

The amount of NFS land in each ROS category in each GA would be very similar to the current situation, with small changes as follows:

- The Rocky Mountain Range GA (PCA), Upper Blackfoot GA (PCA and Zone 1), Divide and Elkhorns GAs (Zone 2) and the Little Belts GA (Zone 3) would all have a slightly smaller proportion of each GA than currently in semi-primitive nonmotorized and a slightly greater proportion in primitive
- The Snowies GA would eliminate semi-primitive nonmotorized that currently exists and increase the proportion of the GA in primitive

These changes would not result in differences on the ground in terms of areas potentially available for motorized access, as both semi-primitive nonmotorized and primitive ROS categories do not allow for motorized travel. The slight changes in ROS designation also reflect existing conditions in those areas of those GAs, and align with management requirements of other area designations, such as inventoried roadless area, Wilderness Study Area, recommended wilderness, and others.

The GAs comprising the PCA and Zone 1 are predominantly in non-motorized settings where ROS categories established in the proposed action indicate that human density will be relatively low and natural processes generally drive vegetation and other landscape characteristics. The remaining GAs vary widely in the proportion of acreage within each ROS setting.

The 2020 Forest Plan includes components related to management of various types of recreation. Components specific to developed recreation activities, sites, and facilities were discussed in the previous section. Plan components related to other types of recreation include:

- FW-REC-DC-07 states that the HLC NF will provide opportunities for dispersed camping.
- FW-RSUP-DC-01 through 03 establish the desired condition of providing recreation opportunities that address demands for certain activities, enhance visitor experience, and contribute to local economies
- FW-RSUP-GDL-01 guides managers to ensure that recreation special use operations should mitigate conflicts with other uses and resource, including use of education to reduce human-wildlife conflicts.

Plan components address access to and within NFS lands for recreation purposes and constrain some access to prevent or minimize negative impacts to wildlife or other resources. These plan components, because they address travel, are discussed above in the section on Habitat Security.

The proposed action designates two Recreation Areas: the South Hills Recreation Area in the Divide GA (zone 2) and the Grandview Recreation Area in the Snowies GA (not in a grizzly bear management zone and outside the area where grizzly bears may be present). Both areas include desired conditions to offer dispersed non-motorized recreation opportunities. In the South Hills Recreation Area mechanized means of transport (such as mountain bikes) would be suitable only on established roads and trails only (DI-SHRA-SUIT-02).

The 2020 Forest Plan includes components that recognize the desire to provide hunting opportunities and access on NFS lands, balanced against the need to maintain wildlife habitat and security (FW-FWL-DC 03 and 04).

Human presence in bear habitat can have a wide variety of potential impacts to bears, from little or no effect, to adverse effects resulting from encounters, food conditioning, direct mortality, and disturbance or displacement. Effects depend on location, timing, activity, individual bear response, and other factors. By establishing a desired condition to provide a variety of recreational opportunities that include motorized access, hunting, and other activities, the proposed plan supports activities that could potentially have adverse effects to individual bears. Plan components that establish areas of relatively low human presence (i.e. primitive and semi-primitive ROS categories) would help to limit the potential for encounters or adverse effects of recreation on bears in those areas. Potentially adverse effects to individual bears may be more likely in areas where motorized travel or greater human presence is anticipated (i.e. areas identified as roaded natural or rural ROS categories). Some activities, such as hunting, that are allowed on NFS lands and guided by the proposed plan, could have beneficial impacts to bears by providing additional sources of late-season food via gut piles or wounded animals, but could also have adverse impacts through potential food-conditioning, bear-human conflicts, and mortality caused by mistaken identity or defense of life. Plan components that guide managers to balance hunting access and opportunity against the need for wildlife security could mitigate some of the risk of mortality associated with hunting.

Livestock grazing

The 2020 Forest Plan would not change number and location of livestock allotments nor the number and type of animals allowed to graze on those allotments. The latter are determined during permit evaluation and development of annual operating plans. The location, size, or management of grazing allotments would not be affected by the proposed plan, and any changes to those would be addressed through site or area-specific range analyses.

The 2020 Forest Plan provides management direction that would be used when annual operating plans are developed, when grazing permits are issued or re-issued, and when allotment management plans are revised or developed. Plan components for management of livestock grazing are retained from the GB Amendments into the 2020 Forest Plan, and include:

- PCAZ1-NCDE-STD-01 and 02 to incorporate requirements into new or reauthorized grazing permits to reduce the risk of grizzly bear-human conflict and to require reporting of livestock carcasses within 24 hours of discovery.
- PCAZ1-NCDE-STD-03 to prohibit increases in the number of sheep allotments or permitted animal unit months above the baseline, PCA-NCDE-STD-10 states that sheep permits in non-use may not increase animal unit months when returning into use, and PCA-NCDE-GDL-09 would reduce the number of open or active sheep allotments when opportunities arise.
- PCAZ1-NCDE-STD-04 to limit potential conflict associated with use of small livestock for weed control or other uses.
- PCA-NCDE-STD-11 prohibits increases in the number of active cattle grazing allotments.

In addition to these plan components, which apply within the PCA and zone 1, the 2020 Forest Plan includes the following plan components that may have an influence on grizzly bears or their habitat:

- FW-GRAZ-DC-02 states vegetation in grazing allotments supports healthy and resilient plant communities that "provide for wildlife habitat and forage needs in addition to providing forage for domestic livestock".
- FW-GRAZ-GO-01 calls for coordination with MFWP biologists during allotment planning and permitting processes to ensure that wildlife habitat and forage needs will be met.
- Several guidelines provide management direction to minimize impacts to riparian and other vegetation resources (refer to 2020 Forest plan components found in Appendix A).

Livestock grazing in bear habitat can have adverse effects on individual grizzly bears through potential for conflicts related to depredation, encounters during livestock management activities, displacement of bears from areas used by livestock, and potentially competition for or impacts of livestock on some types of forage. The potential for effects depends on the extent, timing, and location of livestock use relative to bear use of a given area.

Vegetation management

The 2012 Planning Rule adopts a complementary ecosystem and species-specific approach, known as "coarse-filter/fine-filter", to provide the natural diversity of plant and animal communities and ensure long-term persistence of native species in the plan area. Coarse-filter plan components are designed to maintain or restore ecological conditions for ecosystem integrity and diversity within agency authority and the inherent capability of the land. Plan components that address composition, structure, and function of vegetation communities represent the coarse filter. Terrestrial vegetation desired conditions are designed to maintain and enhance ecological integrity, diversity, function, and resiliency while contributing to social and economic sustainability as required by the 2012 Planning Rule. Desired conditions are based on an analysis of the natural range of variation for key ecosystem characteristics.

Plan components for management of terrestrial vegetation that could have some effects on grizzly bears are as follows:

- FW-VEGT-DC-01 establishes the desired condition to have vegetation maintain or move toward the NRV for ecosystem composition, structure, and function, and to maintain resilience in the face of disturbance.
- FW-VEGT-DC-03 and FW-VEGT-DC-04 establish the desired conditions for vegetation to provide the "habitat requirements to support … threatened or endangered species… based on the inherent capability of lands" and "provide connectivity and allow genetic interchange to occur"
- Specific objectives, standards, and guidelines for vegetation, including forested and non-forested vegetation types, are designed to maintain or move toward desired conditions within the NRV for cover types, species or community presence, and vegetation structure (see proposed plan for details).

- FW-PLANT-DC-01, FW-PLANT-GDL-01, and FW-PLANT-OBJ-01 direct managers to recover and sustain plant species at risk, including whitebark pine

Desired conditions retained in the proposed plan from the GB Amendments also guide vegetation management with respect to grizzly bears and their habitat:

- PCA-NCDE-DC-04 and 05 establishes the desired condition to support vegetation conditions that would sustain grizzly bear recovery and provide for grizzly bear habitat needs over the long term
- PCA-NCDE-GDL-01 would limit the duration of activities related to vegetation management in order to reduce potential disturbance or displacement.
- PCA-NCDE-GDL-04 through 08 would reduce risk of disturbance and would maintain or improve grizzly bear habitat when designing vegetation treatment in the PCA.

The 2020 Forest Plan establishes active vegetation management as an appropriate tool with which to achieve desired vegetation and habitat conditions in the action area. Activities associated with implementing vegetation management have the potential to result in adverse effects to individual bears through displacement or disturbance associated with roads used to access and implement projects; management of roads would be subject to plan components the effects of which are discussed in the Habitat Security section above. Disturbance and displacement or loss of cover as a result of activities at project sites could have adverse effects on individual bears, depending on the location, timing, and type of activity and other factors, all of which would be analyzed and consulted on when specific projects are planned. Vegetation management could, however, have beneficial effects by enhancing and maintaining some food sources. Beneficial effects would also depend on the specific location and treatment type and would be analyzed when specific projects are planned. The plan components above would sustain healthy, resilient plant communities on which grizzly bears depend for food and cover and would minimize the potential for adverse effects resulting from activities associated with project implementation, and from changes in vegetation. Some components discussed above could result in beneficial effects when used to plan vegetation projects that would maintain or enhance grizzly bear food species.

Oil and gas exploration and development

The 2020 Forest Plan, Alternative F would not alter the acreage available for minerals and energy exploration or development as described in the Existing Condition, but rather provides direction for managing any minerals and energy exploration and development that might occur. Components in the proposed plan relating to the management of energy and minerals are as follows (refer to the proposed plan for details:

- FW-EMIN-DC-05 expresses the desired condition of “supplying mineral and energy resources while assuring that the sustainability and resiliency of other resources are not compromised or degraded”.
- FW-RECWILD-SUIT-01 would establish that new leases for leasable minerals within Recommended Wilderness Areas identified in the preferred alternative and designated by the proposed plan would include a no surface occupancy stipulation.
- FW-EMIN-GDL 01 and 02 guide managers to minimize adverse effects to aquatic and riparian resources, including wildlife habitat within those systems.

Plan components for energy and minerals development are retained in the proposed plan from the GB Amendments as follows (see Appendix A for details):

- PCA-NCDE-STD-12: requires no surface occupancy for any new leases for new leasable minerals within the PCA.

- PCAZ1-NCDE-STD-06, 07, 08, 09, 10 and 11: In the PCA and zone 1, retain measures in existing and add measures in new or reauthorized permits, leases, and operating plans to reduce or mitigate potential impacts to bears.
- PCAZ1-NCDE-GDL-02, 03, and 05: In the PCA and zone 1, use specified methods to reduce disturbance or displacement and mitigate impacts to habitat
- PCAZ1-NCDE-GDL-04: In the PCA and zone 1, maintain cover along roads and other infrastructure
- PCAZ1-NCDE-STD-12: In the PCA and zone 1, require bear safety training for all contractors, lessees, and their employees.
- PCAZ1-NCDE-GDL-06: In the PCA and zone 1, recommend that permittees, lessees, operators, and their employees carry bear spray.

The 2020 Forest Plan recognizes energy and minerals exploration and development as appropriate uses of NFS lands within the action area. Activities associated with these uses have the potential to impact individual grizzly bears through construction and use of motorized access routes (discussed in the Habitat Security section above), potential displacement from habitat and/or permanent habitat loss, potential for human-bear encounters and conflicts, and potential for food conditioning from exposure to food or attractants associated with minerals or energy operations.

The plan components listed above would help to minimize potential impacts to bears. Although the Rocky Mountain Range GA, which makes up the majority of the PCA within the action area, is legally unavailable for new minerals leasing, the requirement for no surface occupancy provides an additional measure of certainty that impacts to bears from this use would not occur in the PCA. The same is true for the Elkhorns GA, within zone 2. Any potential new leases for leasable minerals would occur in portions of zones 1, 2 and 3, which likely have a lower density and number of bears and therefore less chance that any individual bear might be impacted by activity associated with this use. Prohibitions on surface occupancy for new leases in recommended wilderness would help those areas retain habitat security.

Other plan components direct managers to minimize or mitigate the impacts of activity associated with existing leases or other types of energy and minerals development, by maintaining important habitat components (including cover), minimizing the risk of conflicts associated with attractants, and minimizing the risk of direct mortality of bears if conflicts occur. The plan does not allow changes to existing leases, permits, or plans of operation without agreement by the leaseholder, so the potential for impacts from those remains as it is currently. Impacts of specific energy and minerals operations would depend on the location, type of operation and type of activities associated with it, timing of installment and operation, and other site and project specific factors, and would be analyzed and consulted on when those operations and plans are proposed.

Connectivity

As discussed in the Existing Condition section, a large portion of the NCDE recovery zone encompassing the action area includes large areas of designated wilderness areas and inventoried roadless areas, and as such is relatively unlikely to experience fragmentation due to human activities. These areas would not change under the proposed plan. The 2020 Forest Plan also would not change the amount of potentially secure habitat described in the Habitat Security and the Connectivity sections in the Existing Condition above. Plan components that would maintain habitat security as described above would contribute to maintaining the potential for connectivity between and among areas on the HLC NF.

The 2020 Forest Plan would include a 48% increase in the total acreage of recommended wilderness areas in GAs that are currently identified as where grizzly bears may be present. Although recommended wilderness areas largely overlap with inventoried roadless areas, they include additional restrictions on certain activities (described in the Habitat Security section above) and would be managed in a way that

would minimize risk of habitat fragmentation and therefore maintain potential connectivity within each recommended wilderness area.

Areas such as the Highway 200 corridor through the Upper Blackfoot GA (PCA and zone 1), and the Highway 12 corridor through the Divide GA (zone 2), in addition to private lands in those areas may provide some impediments to grizzly bear movements through those landscapes, and could limit connectivity between the Northern Continental Divide Ecosystem and the Greater Yellowstone Ecosystem. Although the majority of fragmentation and impacts to connectivity in those areas occur on non-NFS lands that are not affected by FS management actions, the proposed plan includes components that would limit fragmentation or enhance connectivity in those areas:

- DI-WL-GDL-01 provides guidance to manage lands in the Divide GA (within zone 2) to maintain or improve security and connectivity and do so through ensuring that vegetation management provides hiding cover, motorized access is not increased, and the location of new trails will not impact wildlife habitats.
- DI-WL-GO-01 establishes a goal to work cooperatively to acquire ownership and easement to intermingled lands within the Divide GA (within zone 2) for the purposes of connectivity and security.
- UB-WL-GDL-01 provides guidance to manage lands in the west-central and east-central portions of the Upper Blackfoot GA (within the PCA and zone 1) to maintain or enhance wildlife habitat, movement areas, and connectivity; and do so through ensuring that vegetation management provides cover, motorized access is not increased, and the location of new trails only where minimal impacts occur to wildlife.

The proposed action also includes plan components for other GAs that emphasize maintaining connectivity for wide-ranging species such as grizzly bears:

- BB-WL-DC-03, CR-WL-DC-01, EH-WL-DC-02, and RM-WL-DC-01, states that the Big Belts, Crazies, Elkhorns, and Rocky Mountain Range GAs provide habitat connectivity for wide-ranging species … between public lands in northern Montana and those in south and southwestern Montana… .

The proposed action includes plan components that would maintain, enhance, or restore connectivity while managing other resources such as watersheds, vegetation, and wildlife:

- FW-WTR-DC-02 states that spatial connectivity exists within or between watersheds.
- FW-VEGT-DC-04 states that vegetation patterns provide connectivity.
- FW-VEGF-DC-08 states that forest patches of different …conditions form a landscape pattern that contributes to …habitat connectivity.
- FW-WL-DC-03 states that vegetation composition, structure, and distribution allow wildlife to move within and between NFS parcels in response to life history needs and habitat changes.
- FW-WL-DC-04 states that large, unroaded areas are distributed and connected forestwide, providing for species with large home ranges.

In sum, the 2020 Forest Plan includes components that would maintain or enhance the potential for connectivity at varying scales. Connectivity is specifically emphasized in several components at the patch, watershed, GA, and forest scales. Although effective genetic or demographic connectivity between and among areas may be more complex than simply absence of roads or motorized travel, the measures of habitat security described above provide the best means we have available to describe the potential for those areas to allow for movement of bears across the action area and between the NCDE and the GYE. The effects of these area designations and plan components on the ability of individual grizzly bears to move between and among habitats is very difficult to assess, particularly at the scale of this framework programmatic action. We estimate that, added to existing designations for wilderness, wilderness study

areas, and inventoried roadless areas that would not change under the proposed plan, the increase in total acreage of recommended wilderness would be an added factor in maintaining potential connectivity where those areas occur. We also estimate that plan components identifying areas where risk of fragmentation is relatively higher (e.g. in the Divide and Upper Blackfoot GAs) and that direct managers to maintain habitat characteristics and minimize activities that could further fragment those areas would result in maintaining or increasing the ability of individual grizzly bears to move through those landscapes. Other plan components that emphasize connectivity would add to that effect.

Cumulative effects

Cumulative effects include state, tribal, local, or private actions that are reasonably certain to occur in the action area. Federal lands other than those administered by the Forest are not included because those areas are subject to their own section 7 consultation requirements.

Roughly 14% of land within the external boundary of the HLC NF is non-NFS land, largely in the form of private inholdings. Grizzly bears are a wide-ranging, highly mobile species known to travel long distances in search of food and other life history requirements. Individual bears are known to use landscapes with multiple ownerships, and grizzly bear distribution is increasingly including private and other non-federal lands outside of the NCDE recovery zone (Northern Continental Divide Ecosystem Subcommittee, 2019).

It is reasonably certain that development will continue to occur on private lands adjacent to and to some extent within the HLC NF boundary. Development of private lands often increases the risk of grizzly bear-human conflict because bears may be attracted to food, garbage, pet feed, apiaries, small livestock, or other attractants on private lands. Of 439 grizzly bear mortalities documented in the NCDE between 1998 and 2017, 88% were human caused, largely as a result of attractants on private lands (Northern Continental Divide Ecosystem Subcommittee, 2019). This source of conflict and mortality will likely continue to affect bears that use both NFS and private lands and may add to mortality sources occurring on NFS lands.

Development of private lands also has the potential to increase habitat fragmentation, by creating population “sinks” where conflict and mortality occur at relatively higher rates than in less developed areas, by displacing bears from areas of human activity, and by increasing the number of humans present in bear habitat which then increases the probability of encounters that could become conflicts. The increase in motorized access and travel often associated with increasing human development may add to those impacts.

Both vegetation management and management of wildland fire are likely to occur on private lands in the action area throughout the life of the plan. Although vegetation management and wildland fire can benefit bears by maintaining or enhancing food species, the potential for disturbance, displacement, and negative habitat alteration (i.e. loss of cover) caused by vegetation change and by management activities associated with fire or vegetation management on private lands could add to the effects of similar actions on NFS lands if they occur in close spatial and temporal proximity.

Climate change could have the potential to alter the amount and distribution of habitat in the action area in ways that are difficult to predict. Climate models generally predict a warmer and possibly drier climate (U.S. Department of Agriculture, Forest Service, Northern Region, 2015), which could affect low elevation, mesic habitats on adjoining private lands used by bears particularly in spring. Climate change may affect fire intensity and frequency as well, which could have impacts to bear habitat throughout the action area and adjoining lands.

Nature-based recreation (i.e. recreation occurring in or associated with natural settings) has been increasing and is likely to continue to do so (U.S. Department of Agriculture, Forest Service, Northern Region, 2015). Recreation occurring on private or other lands adjacent to NFS lands may spill over onto

NFS lands as the overall number of recreationists increases and could result in pressure to increase recreation developments or facilities on NFS lands in order to accommodate the additional use. Increasing numbers of humans in bear habitat increases the potential for disturbance, displacement, and conflict that could result in grizzly bear mortality.

Hunting continues to be a key recreational activity in the action area, on both public and adjoining private lands. Hunting may provide food sources (i.e. gut piles or unattended carcasses), but those come at a cost of increased risk of encounters and conflicts with humans. Hunting-related grizzly bear mortalities accounted for 16% of the human-caused grizzly bear mortalities in the NCDE between 1998 and 2017, due to self-defense kills and to hunters mis-identifying grizzly bears as black bears (Northern Continental Divide Ecosystem Subcommittee, 2019). Although the State of Montana requires black bear hunters to pass a bear identification test before receiving a black bear hunting license, includes grizzly bear encounter management as a core subject in basic hunter education courses, and encourages hunters to carry bear spray and use it rather than firearms in encounters, hunting-related grizzly bear mortalities are likely to continue to occur on both public and private lands within and adjacent to the action area.

Determination of effects

Implementation of the proposed federal action *May Affect and is Likely to Adversely Affect* the federally listed threatened grizzly bear in the action area, which is the entire HLC NF.

Rationale for determination

This biological assessment analyzes the potential impacts to grizzly bears of implementing the framework programmatic Helena-Lewis and Clark National Forest revised land and resource management plan. Impacts to grizzly bears and their habitat have been considered in the context of factors that may influence grizzly bear survival and habitat use.

The proposed framework programmatic action does not approve nor authorize specific actions or activities, but instead guides development of future actions that will be authorized, funded, and carried out at a later time. The proposed action identifies a number of uses that would be allowed or that would continue to occur in the action area. Those uses include activities that have the potential to affect bears, such as motorized travel (for public recreation and for land and resource management), developed and dispersed recreation (including hunting), livestock grazing, vegetation management, and minerals and energy development. The proposed plan does not determine the amount, location, type, or scope of those future actions, but rather it establishes the desired conditions to be achieved and establishes constraints on future actions when they are planned and implemented. Therefore, the proposed framework programmatic action would not result in direct effects to grizzly bears or their habitat. The location, type, and scope of future actions would be determined at the time of project planning, allowing determination of the actual presence and amount of potential effect at that time. Analysis and consultation will occur as specific projects and actions are planned.

The proposed action would allow continued use of the existing system of motorized routes, which could have adverse effects to individual bears as described in this assessment. Activities associated with vegetation management objectives stated in the proposed action could result in a temporary reduction in effectiveness of up to 7% of potentially secure habitat in individual Grizzly Bear Analysis Units (GBAUs) over the life of the plan. Temporary reductions would occur in up to 6 total GBAUS, but likely no more than 2 concurrently. Recreation, livestock grazing, vegetation and fire management, and minerals and energy development all have the potential to disturb or displace individual grizzly bears or to result in grizzly-bear human conflict.

Plan components supporting maintenance of terrestrial and aquatic ecosystems on the HLC NF would benefit grizzly bears by providing for habitat diversity and ecological conditions that would continue to sustain the NCDE grizzly bear population. At the project level, activities would be subject to plan

components designed to avoid or minimize adverse effects to individual grizzly bears and the habitats they use on NFS lands managed by the HLC NF. Because we cannot predict the exact locations of future projects or activities, we cannot discount the potential for localized, short-term adverse effects to individual bears, particularly within the NCDE in the PCA and Zone 1 where grizzly bears are known to occur. Effects in areas where bears may be present but that are outside of the PCA/recovery zone are expected to be insignificant and discountable.

Canada lynx

Consultation history

The FWS issued two programmatic BOs following listing of Canada lynx as threatened under the ESA. One addressed implementation of existing national forest land and resource management plans (October 25, 2000), and one addressed ongoing operation of ski areas in Montana (February 9, 2001). Both consultations received non-jeopardy opinions from the USFWS. The opinion for the implementation of 1986 Forest Plans did not estimate incidental take because of the programmatic nature of the proposed action and noted that specific actions taken during implementation of Forest Plans would require consultation if they would adversely affect the threatened lynx. The BO for ski areas in Montana concluded that there would be no anticipated take as a result of the proposed or ongoing actions associated with operation of those areas.

In early 2000, the LCNF and the HNF each individually consulted with the USFWS regarding the effects to lynx of ongoing projects and activities, including grazing, special uses, administrative uses, timber harvest, and others (U.S. Department of Agriculture, Forest Service & U.S. Department of the Interior, 2000) (USDA-USDI, 2000). The USFWS concurred with the determinations by both forests (U.S. Department of the Interior, Fish and Wildlife Service, 2000a) (U.S. Department of the Interior, Fish and Wildlife Service, 2000b) that, cumulatively, the ongoing projects and activities were not likely to adversely affect the threatened lynx.

The FWS issued two BOs addressing implementation of the Northern Rockies Lynx Management Direction (NRLMD) that amended 18 Forest Plans. The BO issued in March 2007 concluded that implementation of the standards and guidelines in the NRLMD would not jeopardize the continued existence of lynx. Although the NRLMD is programmatic direction and as such does not authorize any specific actions, the FWS included in the BO an Incidental Take Statement (ITS) based on anticipated use of allowed exemptions to NRLMD standards and guideline, for fuels treatment in the wildland-urban interface (WUI) and for a limited set of other purposes (see the Vegetation Management section below for more information). In 2017, the FS consulted on potential impacts to designated Canada lynx critical habitat of implementing the NRLMD. The October 2017 BO concluded that ongoing implementation of the NRLMD was not likely to result in the destruction or adverse modification of Canada lynx designated critical habitat.

Species status and ecological information

Canada lynx population ecology, biology, habitat descriptions, and relationships identified by research are described in detail in the relevant literature (Holbrook et al., 2018; Holbrook et al., 2019; Holbrook, Squires, Olson, DeCesare, & Lawrence, 2017; Holbrook, Squires, Olson, Lawrence, & Savage, 2017; Interagency Lynx Biology Team, 2013; Megan Katherine Kosterman, 2014; Megan K. Kosterman, Squires, Holbrook, Pletscher, & Hebblewhite, 2018; Lewis, Hodges, Koehler, & Mills, 2011; Olson, Squires, DeCesare, & Kolbe, 2011; Ruediger, Claar, et al., 2000b; U.S. Department of Agriculture, Forest Service, 2007c; U.S. Department of the Interior, Fish and Wildlife Service, 2005a, 2007a). We will briefly summarize key information, focusing on basic elements of Canada lynx life history and those that are relevant to the analysis in this assessment.

Status

The Canada lynx is currently listed as a threatened species under the ESA. The USFWS considers that Canada lynx are resident in "core areas" (U.S. Department of the Interior, Fish and Wildlife Service, 2005b) (see information below under the heading "Distribution in the Action Area") in western Montana, which corresponds on the HLC NF with the Rocky Mountain Range GA. Canada lynx are considered transient in "secondary" and "peripheral" areas, which include the remaining GAs. Based on the descriptions of these areas (ibid) and on the most current information provided by the FWS (https://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species/Forests/Helena-L&C_sp_list.pdf, accessed on 22 October 2019 and last updated 29 July 2019), lynx may be present anywhere on the HLC NF. Therefore, this assessment includes discussion of impacts across the entire HLC NF.

Lynx distribution in the western United States is also described in an amendment (U.S. Department of Agriculture, Forest Service, 2006b) to the Canada Lynx Conservation Agreement (U.S. Department of Agriculture, Forest Service & U.S. Department of the Interior, 2005) as 'occupied' or 'unoccupied' based on verified records since 1999 , which has relevance to management under the NRLMD (U.S. Department of Agriculture, Forest Service, 2007c). As designated in the amended Canada Lynx Conservation Agreement (2006) and NRLMD, lynx habitat in the Rocky Mountain Range, Upper Blackfoot, and Divide GAs is currently considered 'occupied' habitat, and the island mountain ranges, comprising the remaining seven GAs, are currently considered 'unoccupied' by lynx (Figure 3). An area is considered occupied when there are at least two verified observations or records since 1999, unless they are verified to be transient individuals, or if there is evidence of reproduction (U.S. Department of Agriculture, Forest Service, 2006b).

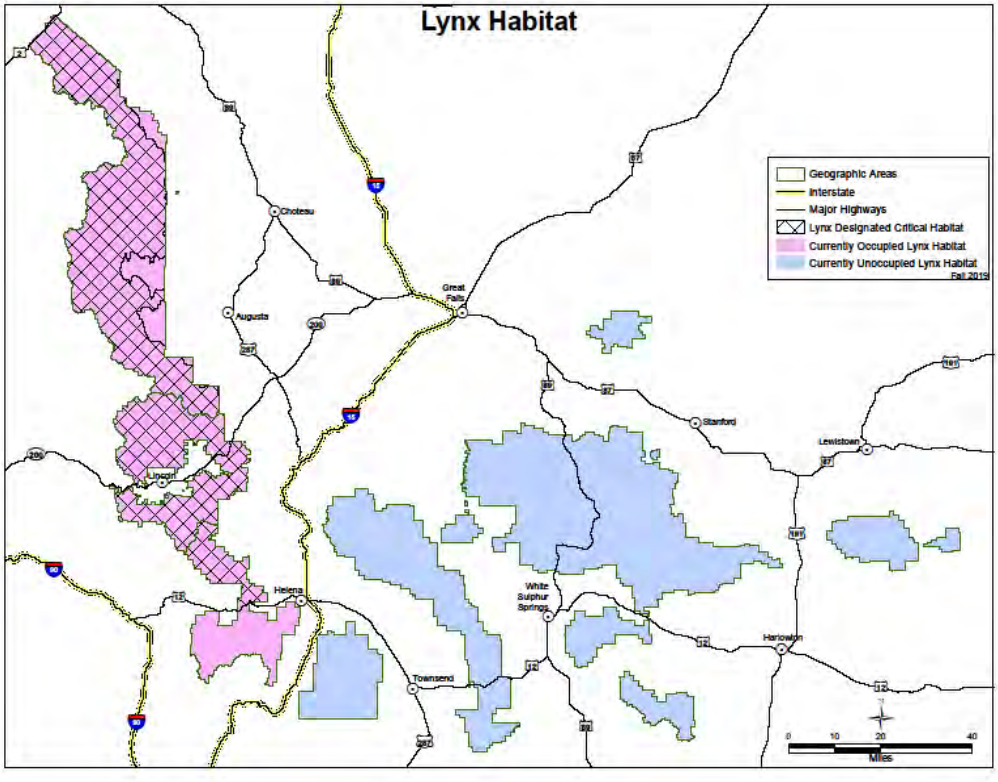

Figure 3. Lynx habitat on the Helena-Lewis and Clark National Forest (action area)

Reproduction, survival, and mortality

Detailed information regarding lynx population biology is widely available in the published literature, some of which is cited in this document and all of which is available through numerous sources as noted previously in this assessment. The following information is summarized from the most recent Lynx Conservation Assessment and Strategy (henceforth "LCAS"; (Interagency Lynx Biology Team, 2013), which summarized and synthesized the best available science regarding lynx biology and ecology at the time it was compiled. Additional or updated information is included in this assessment as needed and is referenced where it is used.

Canada lynx breed in late winter/early spring, producing anywhere from one to five kittens per litter. Lynx females may use more than one den during the period in which kittens are reared, with dens commonly located in clumps of large woody debris, and less commonly under ledges, in boulder fields, under live vegetation, or in slash piles. Dens provide kittens with protection from temperature extremes, precipitation, and predators, and are located in or adjacent to foraging habitat.

The most commonly reported sources of mortality for Canada lynx are starvation, particularly of kittens, and direct human-caused mortality. Causes of human-related mortality include trapping (including trapping for other species where lynx are captured accidentally/incidentally), shooting, and vehicle collisions. Predation of Canada lynx by cougars, coyotes, wolverines, wolves, fisher, and other lynx has also been reported.

Snowshoe hares, the primary food source for lynx (see below) tend to occur at lower densities in the southern part of their range as compared to the north, with hare densities in the western United States ranging widely depending on location. In northern boreal forests lynx populations may be cyclic, with years of low snowshoe hare abundance corresponding to years of increased lynx mortality directly due to starvation, and indirectly from other causes during hunger-related dispersal. In the southern part of their range, snowshoe hare populations appear to have less dramatic cycles, and Canada lynx may also rely more on alternate prey than do lynx in the northern portion of their range.

Food habits

Snowshoe hares are the primary prey of lynx throughout their range (Mowat, Poole, & O'Donoghue, 2000); (Interagency Lynx Biology Team, 2013). Summer diets may contain a broader range of prey species, based on their availability (Squires, Decesare, Kolbe, & Ruggiero, 2010). Red squirrels are an important secondary prey species in many areas, while grouse, northern flying squirrel, ground squirrels, porcupine, beaver, mice, voles, shrews, weasels, fish, ungulates, and ungulate carrion have all been reported in the diets of lynx in various portions of their range (Interagency Lynx Biology Team, 2013). In winter, lynx diets are limited primarily to snowshoe hare due to snow characteristics and to the ecology of various alternate prey species. Because lynx diets rely heavily on snowshoe hares, lynx conservation and management is largely focused on conservation and management of habitat used by snowshoe hares.

Habitat

Lynx use habitats in which their primary prey is available. Broadly, Canada lynx habitat is defined as boreal forest. More specifically, snowshoe hares occur in boreal forests with dense horizontal cover that reduces their exposure to predators and provides thermal protection and access to food (Interagency Lynx Biology Team, 2013). Lynx habitat in the northern Rockies consists of habitat types that are capable of dense horizontal cover (Interagency Lynx Biology Team, 2013; Ruediger, Claar, et al., 2000b); (J. D. Holbrook et al., 2017; Squires et al., 2010), and include Engelmann spruce, subalpine fir, aspen or lodgepole pine mixed with spruce-fir, and lodgepole pine. Lynx generally do not use drier habitats, including dry lodgepole pine and dry Douglas fir, because these habitats do not provide horizontal cover. Research in western Montana found that winter snowshoe hare density was highest in dense, mature forests, and in summer was highest in both dense young and dense mature forest (Interagency Lynx Biology Team, 2013). Holbrook et al. (2017) found that although dense, young, regenerating forests

generally provide more abundant snowshoe hares than other structural classes, lynx prefer to hunt in mature forest where hares are more accessible. They also found that over half of female lynx home ranges in their study area contained >50% mature forest. Kosterman et al. (2018) investigated the relationship between lynx reproductive success and forest structural composition and arrangement. They found that abundant and connected mature forest and intermediate amounts of small-diameter regenerating forest in core use areas of female lynx home ranges were associated with high reproductive success.

Existing condition

Population trend

No reliable information is available regarding the number of lynx or trend of the lynx population in the action area. Efforts in the Northern Region USFS to maintain lynx populations have focused on maintaining habitat (see below).

Distribution in the action area

The action area is within the Northern Rocky Mountains Geographic Area for lynx; note that this use of the term "Geographic Area" is different from that used within the 2020 Forest Plan and refers to a broad region that encompasses all lynx habitat throughout several states in the northern Rocky Mountains of the United States (Interagency Lynx Biology Team, 2013). In Montana, lynx are primarily restricted to northwestern Montana. Most of the action area is outside of the current known distribution (Figure 3).

In the action area, Canada lynx are resident throughout the Rocky Mountain Range and Upper Blackfoot GAs and in the northern portion of the Divide GA. The portion of their range within the Northern Rocky Mountain Range GA is considered to be within the Northwestern Montana/Northeastern Idaho core area (Interagency Lynx Biology Team, 2013); (U.S. Department of the Interior, Fish and Wildlife Service, 2005a). A "core area" is an area "with the strongest long-term evidence of the persistence of lynx populations supported by a sufficient quality and quantity of habitat" (U.S. Department of the Interior, Fish and Wildlife Service, 2005a). More specifically, core areas have verified evidence of long-term historical and current presence of lynx populations that are persistent despite periodic fluctuations, have evidence of reproduction within the past 20 years, and have boreal forest vegetation types of the quality and quantity to support lynx and snowshoe hare (ibid). The northwestern Montana/northeastern Idaho area coincides with the area in which Canada lynx critical habitat has been designated and is protected under the ESA (Figure 1 and Figure 3), Canada lynx designated critical habitat on the HLC NF; see also below, critical habitat consultation). On the Forest, critical habitat occurs on the Rocky Mountain Range, Upper Blackfoot, and Divide geographic areas.

According to the Lynx Strategy (Interagency Lynx Biology Team, 2013) and the Recovery Outline (U.S. Department of the Interior, Fish and Wildlife Service, 2005a), the remainder of the action area occurs within "secondary areas", with the exception of the Highwoods and Snowies GAs, which are considered "peripheral". Secondary areas are defined as having "fewer and more sporadic current and historical records of lynx", and no documentation of reproduction (ibid). Peripheral areas have sporadic historical records of lynx, generally corresponding to cyclic population highs in populations in Canada (ibid) and have no records or evidence of reproduction. Both these areas "may contribute to lynx persistence by enabling successful dispersal and recolonization of core areas, but their role in sustaining lynx populations remains unknown" (Interagency Lynx Biology Team, 2013). The Strategy states that lynx habitat in secondary and peripheral areas appears to be inherently patchier and less productive than in core areas.

As noted in the "Status" section above, the Rocky Mountain Range, Upper Blackfoot, and Divide GAs are currently considered 'occupied', and the remaining seven GAs, are currently considered 'unoccupied' by lynx. Table 14 summarizes the distribution and habitat categorization for Canada lynx on the HLC NF. The first column indicates potential presence as determined by the USFWS (Montana Fish Wildlife and

Parks, 2018); the second column indicates the habitat classification as described in the Canada lynx Recovery Outline (U.S. Department of the Interior, Fish and Wildlife Service, 2005b), and the third column indicates whether the area is considered occupied per the 2006 amendment (U.S. Department of Agriculture, Forest Service, 2006b) to the Canada Lynx Conservation Agreement (U.S. Department of Agriculture, Forest Service & U.S. Department of the Interior, 2005) and NRLMD (2007d).

Table 14. Canada lynx occupancy and habitat designations in the action area

Geographic area[1]	Range - Montana[2]	Category[3]	Current occupancy status[4]
Big Belts	Transient	Secondary	Unoccupied
Castles	Transient	Secondary	Unoccupied
Crazies	Transient	Secondary	Unoccupied
Divide	Resident	Core and secondary	Occupied
Elkhorns[5]	Transient	Secondary	Unoccupied
Highwoods	Transient	Peripheral	Unoccupied
Little Belts	Transient	Secondary	Unoccupied
Rocky Mountain Range	Resident	Core	Occupied
Snowies	Transient	Peripheral	Unoccupied
Upper Blackfoot	Resident	Core	Occupied

Most of the research on lynx in Montana has occurred west of the Continental Divide. Therefore, detailed or area-specific information about lynx distribution in the planning area is not available. Work has been done, however, to delineate lynx habitat within the action area.

Habitat status in the action area

Canada lynx habitat was originally mapped separately for the formerly separate Helena NF and Lewis and Clark NF, based on regional guidance and using data sources available at the time. In 2010 the east-side forests of the Northern Region (Helena, Lewis and Clark, Custer, and Gallatin NFs) began collaborating on an effort referred to as the "East Side Assessment", intended to develop reliable, consistent habitat mapping and modelling protocols that could be used for mid to large scale assessments of forest and habitat conditions. Lynx habitat maps were updated in 2018 to incorporate Regional lynx mapping direction (USDA FS Regional Forester habitat clarification memo Sept 6, 2016); the update also included refined modeling processes initially developed in the "East Side Assessment" to predict habitat structural conditions for the plan area (U.S. Department of Agriculture, Forest Service, 2019).

Table 15 displays for each GA, and forestwide, the total amount of mapped potential lynx habitat, and the amount by current, modeled vegetative structural stage. Acreages of total potential lynx habitat (second

[1] Geographic Area (GA), as defined in the 2020 Forest Plan/proposed action.
[2] Range in Montana, detailed in the US Fish and Wildlife Service's Threatened, Endangered, and Candidate Species List for the Helena-Lewis and Clark National Forest (U.S. Department of the Interior, Fish and Wildlife Service, 2019) https://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species/Forests/Helena-L&C_sp_list.pdf, accessed 22 October 2019).
[3] Area category, defined in the Canada Lynx Recovery Outline (U.S. Department of the Interior, Fish and Wildlife Service, 2005a).
[4] Occupancy, defined in the Canada Lynx Conservation Agreement (U.S. Department of Agriculture, Forest Service & U.S. Department of the Interior, 2006)
[5] Portions of this geographic area are administered by the Beaverhead-Deerlodge National Forest, with plan components in the proposed action to direct that management.

column) are derived from the most recent (2018) lynx habitat mapping. Acres of habitat in each structural stage category are derived from vegetation data sources as well as harvest and fire data. The numbers in Table 15 are broad scale estimates intended to provide an overall picture of the current status of lynx habitat on the HLC NF and are not intended to represent the level of precision needed for project level planning or analysis.

Table 15. Lynx habitat in the action area[6]

Geographic Area	Lynx analysis unit total acres	Total potential lynx habitat acres[7]	Stand initiation[8] acres (%)	Early stand initiation[9] acres (%)	Multistory[10] acres (%)	Other[11] acres (%)
Occupied						
Rocky Mountain Range	737,322	468,177	36,375 (9)	130,922 (32)	81,770 (20)	218,307 (46)
Upper Blackfoot	338,689	250,890	21,863 (9)	65,249 (27)	67,705 (29)	94,612 (37)
Divide	202,642	111,309	3,557 (3)	1,770 (2)	38,782 (35)	69,140 (60)
Total Occupied	1,278,653	830,376	61,796 (7)	197,940 (24)	188,257 (23)	382,059 (46)
Unoccupied						
Big Belts	159,531	81,724	3,683 (4)	5,640 (7)	23,807 (29)	48,580 (59)
Castles	35,093	28,946	68 (0)	624 (2)	5,989 (21)	22,266 (76)
Crazies	55,466	37,058	969 (3)	2,291 (7)	20,916 (61)	12,882 (34)
Elkhorns	161,232	71,895	9,015 (14)	2,221 (3)	18,221 (27)	42,377 (58)
Highwoods[12]	N/A	N/A	N/A	N/A	N/A	N/A
Little Belts	564,110	429,486	16,810 (4)	14,641 (4)	194,997 (47)	202,966 (47)
Snowies	100,009	29,433	399 (1)	488 (2)	9,301 (33)	19,223 (65)
Total Unoccupied	1,075,441	649,351	30,337 (5)	23,444 (4)	267,980 (41)	340,703 (52)
Forestwide Total	**2,354,094**	**1,479,969**	**92,132 (6)**	**221,393 (15)**	**456,237 (31)**	**721,887 (48)**

The amount of habitat in the structural stage categories shown in Table 15 will change over time because of succession and forest growth, as well as disturbances such as fire, harvest, pre-commercial thinning, or insect infestation. Site-specific analysis for project level work would use maps updated with current structural stage information, supplemented with field validation, to evaluate the status of lynx habitat in those project areas.

The amount of area required to sustain persistent occupation of a female lynx year-round depends on a variety of factors, including the structural quality and arrangement of habitat within the home range, abundance of hares, cycling of hare populations, availability of alternate prey species, and others. Female

[6] Acres presented here are those NFS lands in the action area. State, private, and other non-federal lands in the action area are enumerated below under cumulative effects. The quality and determination of structural stages are assumed here but will be verified at the project scale.
[7] The slight difference in acres (1,359 acres) between the total potential lynx habitat and the structural stages is an artifact of mapping processes. Potential lynx habitat modelled August 26, 2018.
[8] Stand initiation structural stage that may provide year-round snowshoe hare habitat because the trees have grown tall enough to protrude above the snow in winter depending on site-specific stand conditions and horizontal structure.
[9] Stand initiation structural stage where the trees have not grown tall enough to protrude above the snow in winter but can provide snowshoe hare habitat during the non-winter months and is typically moving toward year-round snowshoe hare habitat.
[10] Multistory structural stage with many age classes and vegetation layers that may provide year-round snowshoe hare habitat via dense horizontal cover depending on site-specific stand conditions and horizontal structure.
[11] Any stand that does not fall into one of the above categories, to include Other, NFV and SE. Stands in this column may or may not provide foraging habitat for lynx and require ground validation at the project planning scale.
[12] Does not contain enough mapped potential habitat to delineate an LAU (U.S. Department of Agriculture, Forest Service, 2019).

lynx home range size estimates vary from less than 10 mi^2 (6,400 acres) in northern Minnesota, to over 50 mi^2 (32,000 acres) in the southern Canadian Rockies (Interagency Lynx Biology Team, 2013), with female home range size in northwestern Montana estimated at over 40 mi^2. The Lynx Strategy (ibid) suggests that in the western U.S. at least 10 mi^2 (6,400 acres) of primary vegetation (e.g., spruce/fir habitat types) must be present to support a female home range.

Based on the updated habitat map, the Castles, Crazies, Elkhorns, Big Belts, and Snowies GAs contain limited amounts of habitat capable of supporting only a few lynx home ranges each. The Highwoods are a small, isolated mountain range and the updated lynx map indicates that the amount of primary lynx vegetation in this GA is insufficient to support a lynx home range. These GAs are all isolated mountain ranges, separated from each other and from other lynx habitat by significant stretches of low elevation, often agricultural landscapes that do not support lynx or their primary prey species. The size, isolation, and habitat characteristics of these GAs likely preclude them from currently or historically sustaining persistent lynx occupation.

The Big Belts, Castles, Crazies, and Elkhorns GAs fall within the broadly drawn 'secondary area' in the Lynx Recovery Outline (U.S. Department of the Interior, Fish and Wildlife Service, 2005a) and the Snowies and Highwoods within the area identified as 'peripheral'. Secondary and peripheral areas are not likely to support home ranges and reproduction over time (Interagency Lynx Biology Team, 2013). Secondary areas contain boreal forest types, but those forests may be inherently patchier and/or drier and have snow or habitat conditions that are not favorable to lynx (ibid). In peripheral areas, habitat may occur in small patches not well connected to larger patches of high-quality habitat (ibid); island mountain ranges are often identified as peripheral because of their size and lack of connection to other areas of lynx habitat (ibid). Peripheral areas "are considered to be incapable of supporting self-sustaining populations of lynx" (ibid). It is possible that secondary and peripheral areas may play a role in sustaining lynx populations during times of population fluctuation (ibid), but that possibility remains unclear and speculative. All of the above GAs are also considered currently unoccupied by lynx (U.S. Department of Agriculture, Forest Service, 2006b).

The Little Belts GA, also within the secondary area (U.S. Department of the Interior, Fish and Wildlife Service, 2005b), contains more potential lynx habitat than the other GAs that occur east of Interstate 15, but this GA is also an isolated mountain range, and the nearest neighboring mountain ranges (Big Belts and Castles) do not appear capable of sustaining persistent lynx presence. The patchiness, amount, and arrangement of foraging habitat at any given time makes it unlikely that lynx would persist over the long term in the Little Belts GA. The Little Belts GA is currently considered unoccupied.

Most of the lynx habitat in the Divide GA occurs west of the Continental Divide and is contiguous with the Upper Blackfoot GA and adjoins the Garnet Range, which has the southernmost lynx habitat in Montana known to be currently occupied (Interagency Lynx Biology Team, 2013). The Rocky Mountain Range and Upper Blackfoot GAs are within the core area as identified in the Recovery Outline (U.S. Department of the Interior, Fish and Wildlife Service, 2005b), and together contain more lynx habitat than any other GAs in the plan area. These GAs are well connected to large areas of Canada lynx habitat on the Flathead and Lolo NFs to the west, and Glacier National Park to the north. The combined Rocky Mountain Range, Upper Blackfoot, and Divide GAs provide most of the lynx habitat on the Forest, are connected to lynx habitat to the north and west, and may provide some level of connectivity with the identified core area in the Greater Yellowstone area to the south. The Divide, Upper Blackfoot, and Rocky Mountain Range GAs are all currently considered occupied and occur, in part, in Canada lynx designated critical habitat unit 3 (U.S. Department of Agriculture, Forest Service, 2006b).

Forests having lynx habitat in Region One delineated lynx analysis units (LAUs) per direction in the original LCAS (Ruediger, Claar, Mighton, et al., 2000) to facilitate project-level assessments and impact analyses. LAUs approximate the size of a female home range and were drawn using original habitat maps for each forest, capturing enough year-round habitat (approximately 10 mi^2 or roughly 6,430 acres of

primary vegetation, such as spruce-fir forest) to support one female lynx. As a result of the 2018 updated potential habitat map, the HLC NF adjusted LAUs according to guidance in the LCAS (Ruediger, Claar, et al., 2000a); (Interagency Lynx Biology Team, 2013) and in compliance with NRLMD Standard LAU S1 (U.S. Department of Agriculture, Forest Service, 2007c). Although the most recent LCAS (Interagency Lynx Biology Team, 2013) notes that LAUs need not be established in secondary/peripheral areas, the HLC NF has continued to delineate LAUs in those areas to aid in analysis of effects to potential lynx habitat, particularly when considering use of the NRLMD standards and guidelines in currently unoccupied areas.

Factors affecting Canada lynx

The revised strategy (Interagency Lynx Biology Team, 2013) identifies anthropogenic influences on lynx and lynx habitat (Table 16), described in two tiers. First tier anthropogenic influences can directly affect both snowshoe hare and lynx populations. 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. In concert with the revised Strategy, this biological assessment will focus on first and second tier anthropogenic influences (henceforth "Influences") and their relationship to the proposed action.

Table 16. Anthropogenic influences on Canada lynx and Canada lynx habitat as identified in the Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team, 2013)

Anthropogenic influences on lynx and lynx habitat	
First Tier	**Second tier**
Vegetation management	Incidental trapping
Wildland fire management	Recreation
Habitat fragmentation	Mineral and energy exploration and development
Climate change	Illegal shooting
	Forest/backcountry roads and trails
	Domestic livestock grazing

Forest management practices fall within both tiers of anthropogenic influences as described above. Management practices and uses currently allowed in potential lynx habitat on the HLC NF are summarized in Table 17. These uses are identified based on Management Area (MA) and other designations in the current (1986) Helena NF and Lewis and Clark NF plans. Not all of the anthropogenic influences shown in Table 16 above are included in Table 17 because not all can be appropriately described in the terms used in that table.

Table 17. Potential Canada lynx habitat and Canada lynx designated critical habitat by types of use currently allowed under the existing (1986) Helena NF and Lewis and Clark NF plans

Allowable uses under the 1986 Helena National Forest and Lewis and Clark National Forest Plans	Total NF acres	Acres occupied potential lynx habitat	Acres unoccupied potential lynx habitat	Acres potential lynx critical habitat
Timber harvest[13]	1,654,916	338,604	422,213	296,108
Timber production[14]	414,936	70,653	156,619	46,237
Livestock grazing	1,355,143	178,134	356,816	148,417
Wheeled motorized	1,099,010	130,464	348,549	91,024
Over-the-snow motor vehicle	1,043,323	203,590	329,375	155,394

The information in Table 17 indicates what is generally allowed under the 1986 Helena NF and LC NF Plans, but actual use on the ground is constrained by resource-specific standards and guidelines, including application of the NRLMD in occupied lynx habitat, and consideration of the NRLMD in currently unoccupied habitat. The location, amount, and duration of any of the uses shown in Table 17 is determined after site-specific analysis and appropriate Section 7 consultation regarding potential impacts to Canada lynx and other ESA-listed species.

In addition to the uses displayed in Table 17, there are some permits and leases for minerals and energy development on the HLC NF (see 'Minerals' section below). Decisions about leasing or permitting areas for minerals exploration or development are not made at the Forest Plan level and are tied to other processes occurring separately and subject to specific laws and regulations. Forest Plans guide the specific manner in which the activities allowed by minerals leases or permits are carried out on the ground.

The current status of lynx and lynx habitat related to the anthropogenic influences listed in Table 16 and occurring on the HLC NF are described in more detail below under appropriate headings.

Vegetation management

Canada lynx rely on snowshoe hare, which require boreal forest that contains dense, horizontal cover (Interagency Lynx Biology Team, 2013). Therefore, disturbances that alter or remove horizontal cover or convert forest to structural stages that do not provide habitat for snowshoe hare during the winter period have the potential to impact Canada lynx. These disturbances include vegetation management, which can be considered as both a stressor and driver of Canada lynx habitat. In general, treatments used in vegetation management remove trees and/or reduce horizontal cover through logging, masticating, thinning, sawing, burning, and others. Figure 4 and Figure 5 detail such vegetation management projects that have occurred in occupied lynx habitat in the action area from 2007-2019 where use of exemptions and exceptions to NRLMD standards have been applied.

[13] Timber harvest is the removal of trees for wood fiber use and other multiple-use purposes (36 CFR 219.9)
[14] Timber production is 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).

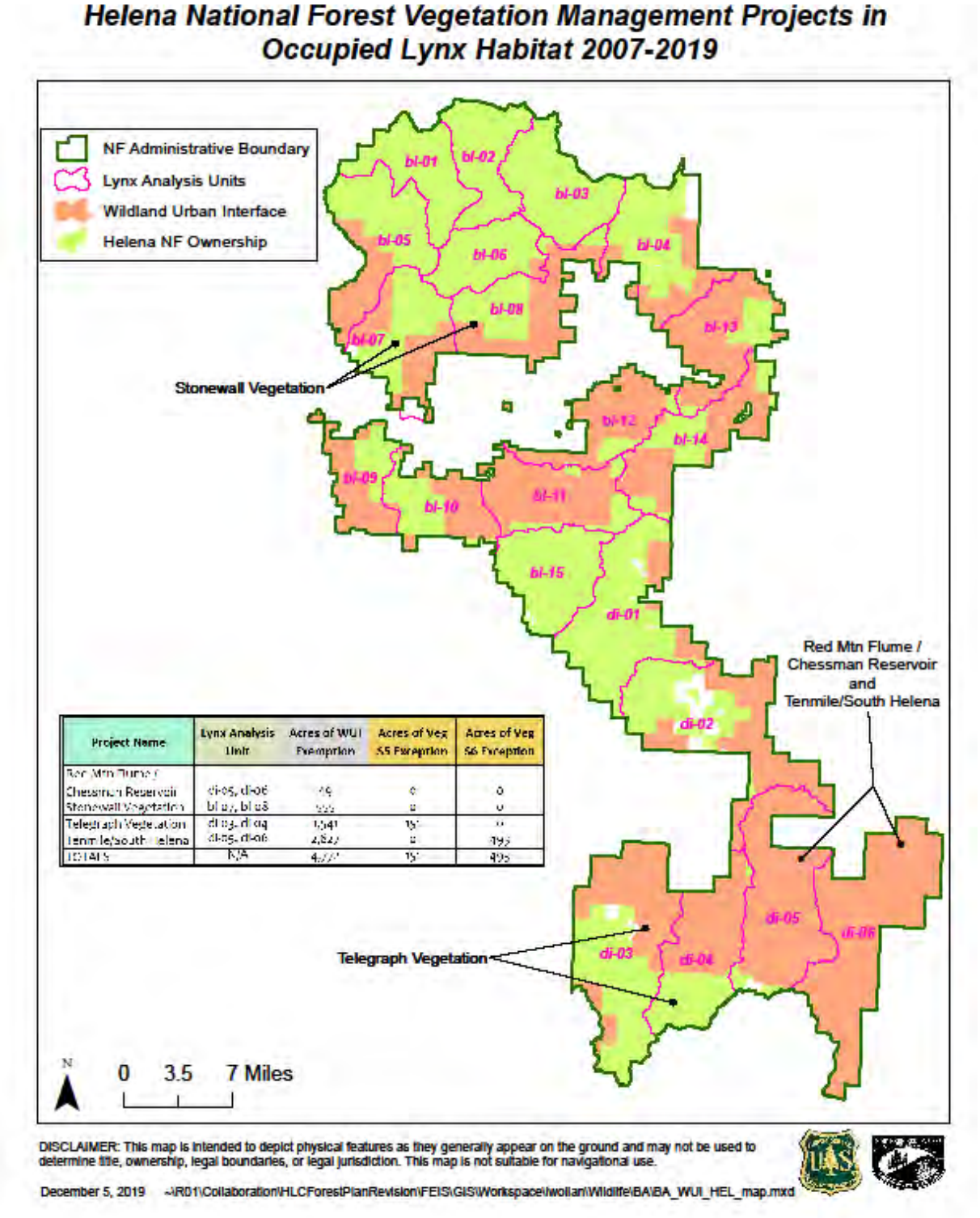

Figure 4. Vegetation management projects on the Helena National Forest in occupied lynx habitat between 2007-2019 where use of exemptions and exceptions to NRLMD standards have been applied

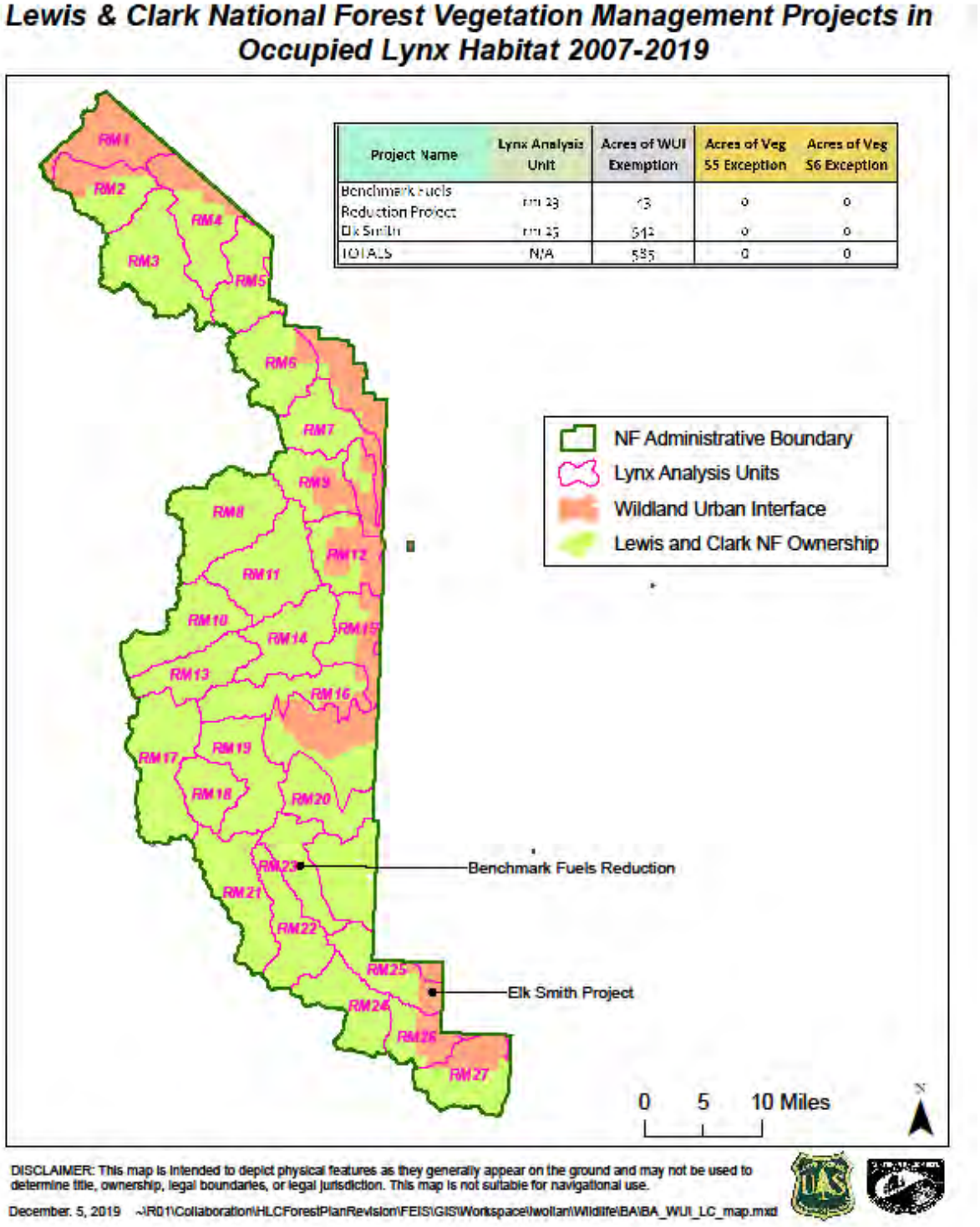

Figure 5. Vegetation management projects on the Lewis and Clark National Forest in occupied lynx habitat between 2007-2019 where use of exemptions and exceptions to NRLMD standards have been applied

Certain types of vegetation management can also promote development of Canada lynx habitat by returning a stand or area to an earlier successional stage that may eventually provide habitat (such as dense, young regenerating forest), or by creating openings within existing forest canopies that promote development of multiple canopy layers. Maintaining a habitat mosaic of different successional stages within the forest types likely to be used by lynx is a key strategy for maintaining a range of suitable lynx habitats over time. Squires et al. (2010) state, "Managers should prioritize retention of a habitat mosaic of abundant and spatially well-distributed patches of mature, multilayer spruce-fir forests and younger forest stands". Vegetation management activities, including prescribed fire, can be designed to increase potential future lynx habitat, to promote or restore connectivity among patches of existing lynx habitat, and to create a mosaic of successional stages as recommended in Squires et al. (2010), Holbrook et al. (2017), and Holbrook et al. (2019). The effects of those management actions may be negative in the short term, even where they promote future habitat in the long term. Recent research by Holbrook et al. (2018), for example, evaluated lynx responses to differing silvicultural treatments. They found that in their study area lynx used silvicultural treatments (regeneration, thinning, and selection cut harvests) post-harvest, but there was little use by lynx during the first 10 years following treatments.

Current management and status of vegetation in Canada lynx habitat in the action area

Allowable uses

Current vegetation management on the HLC NF is guided at a programmatic scale by the Forest Plans and the activities that are allowed by them as shown above in Table 17. There are approximately 70,653 acres of potential lynx habitat on the HLC NF where commercial timber production (the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use; see glossary) is considered a potentially suitable activity. Those acres identify lands where timber production is a potential use rather than actual acreage where timber production has occurred or will occur.

Additionally, timber harvest (removal of trees for varied purposes; see glossary) is currently a potential activity on approximately 338,604 acres of potential lynx habitat on the HLC NF. As with timber production, that acreage represents the acreage on which harvest is potential use that could be allowed, with actual harvest occurring on a much smaller acreage as individual projects are planned and implemented.

A large amount of occupied lynx habitat is located within designated areas in which vegetation management is either prohibited or is constrained. Designated areas are managed according to law, regulation, and policy specific to the type of designation. Descriptions of designations and the plan components supporting these areas are discussed in association with the Recreation sections of the 2020 Forest Plan and analysis documents but are discussed here briefly because of their effects on vegetation management and therefore on lynx habitat. Designated areas with prohibitions or constraints on vegetation management activities include the following:

- Congressionally designated wilderness areas – Vegetation management actions are prohibited with the exception of prescribed fire when necessary to protect values at risk outside of the wilderness area. Motorized and mechanized uses are not allowed. Permanently designated by Congress. Management direction in Wilderness Act of 1964 (public law 88-577), Forest Service Manual 2320, wilderness plans, and legislation establishing each area (public law 88-577 for the Bob Marshall and Gates of the Mountain Wilderness Areas, 1964; and public law 92-395 for the Scapegoat Wilderness Area, 1972).
- Wilderness study act area (WSA) – Timber harvest is not allowed, and vegetation is largely shaped by natural processes although prescribed fire is allowed where it can be used to help restore the natural role of wildland fire. Motorized and mechanized uses are absent or restricted to a minimum of major access routes. Designated by Congress. Management directed by the Montana Wilderness Study Act of 1977 (public law 95-150) and supplemented by direction in forest plans.

- Recommended wilderness areas (RWA) – No timber harvest is allowed, and vegetation is largely shaped by natural processes, although prescribed fire is allowed for resource benefit. Motorized mechanized uses are absent or restricted to access routes on the periphery. Recommended in Forest Plans according to direction in the Planning Rule. Management directed by forest plans.
- Inventoried roadless areas (IRA) – Timber harvest of small diameter trees may occur only for resource benefits and in limited acreage near existing access routes. Vegetation is largely shaped by natural processes, although prescribed fire is allowed for resource benefit. Motorized access occurs only on the limited mileage of existing routes. Designated by Congress. Management directed by the 2001 Roadless Rule (36 CFR 294 Subpart B, published at 66 Fed Reg. 3244-3273).
- Conservation management area (CMA) – Unique Congressional designation on the Rocky Mountain Range GA in which timber harvest is limited to areas immediately adjacent to existing motorized access routes, and timber production is prohibited. Vegetation is shaped by natural processes, although prescribed fire is allowed for resource benefit. Motorized travel is permanently limited to a small number of existing routes. Permanently designated by Congress. Management directed by the National Defense Authorization Act for Fiscal year 2015 (public law 113-291).

Some of these designations overlap; for example, RWAs are almost entirely within areas identified as IRAs, in part because the characteristics of remoteness and lack of motorized access found in IRAs meet the criteria for RWAs. Similarly, the CMA on the Rocky Mountain Range GA occurs entirely within the Bear-Marshall-Scapegoat-Swan IRA.

Table 18 shows the amount of mapped lynx habitat occurring within designations that prohibit or largely constrain vegetation management activities. Note that, as described above, some designations overlap; we displayed RWAs and the CMA despite their overlap with IRAs, because the former designations carry additional restrictions on management activities.

Table 18. Potential lynx habitat within designated areas, by currently occupied or unoccupied existing condition

Designated area	Acres occupied potential lynx habitat	Percent of occupied potential lynx habitat	Acres unoccupied potential lynx habitat	Percent of unoccupied potential lynx habitat
Congressionally designated				
Wilderness areas	361,680	45%	10,032	1%
Wilderness study areas	0	0%	77,973	11%
Inventoried roadless areas	322,164	40%	410,242	60%
Conservation Management Area	68,442	9%	0	0%
Administratively designated[15]				
Research natural areas	2,246	<1%	3,232	<1%
Recommended wilderness areas	13,553	2%	8,036	1%

Of the 796,222 acres of occupied potential lynx habitat in the action area, approximately 361,680 acres occur in designated wilderness. Another 322,164 acres of occupied potential lynx habitat are in inventoried roadless areas. Other remaining portions of occupied habitat occur in the conservation management area, research natural areas, and recommended wilderness areas. However, in the action area, occupied and unoccupied potential lynx habitat may occur in areas that have multiple designations on the same piece of ground. Each designation may have its own distinct management direction, either congressionally prescript or as directed by forest plans. Currently, without overlap, approximately 1,951,896 acres of NFS lands in the action area occur under one of the above designations. Of those,

[15] Administratively designated areas are identified in forest plans

648,255 acres are occupied potential lynx habitat, and 422,414 acres are unoccupied potential lynx habitat.

Standards and guidelines

Where they are allowed, the specific location, size, type, timing, and other aspects of vegetation management treatments are constrained by Forest Plan standards and guidelines related to management of various resources, including lynx habitat. Prior to 2007, neither the Helena nor the Lewis and Clark NF plans included specific guidance for management of lynx habitat. Between 2005 and 2007, both forests were parties to the Lynx Conservation Agreement (U.S. Department of Agriculture, Forest Service & U.S. Department of the Interior, 2005), and as such relied on the LCAS (Mowat et al., 2000) to guide vegetation management. In 2007, the Regional Forester signed the Northern Rockies Lynx Management Record of Decision (U.S. Department of Agriculture, Forest Service, 2007c), incorporating the NRLMD into to Forest Plans in the Northern Region.

The standards in the NRLMD constrain vegetation management by:

- limiting regeneration-type vegetation management to limit the portion ($\leq$30%) of a given LAU that would be in a structural stage not providing winter snowshoe hare habitat and limiting the number of LAUs that are at or exceed 30% of habitat not providing winter hare habitat at any one time (VEG S1);
- limiting regeneration harvest to no more than 15% of the potential lynx habitat in given LAU during any 10-year period (VEG S2);
- prohibiting precommercial thinning (see glossary) in potential lynx habitat while the habitat is in structural stages that provide winter snowshoe hare habitat (VEG S5); and
- prohibiting vegetation management that would reduce snowshoe hare habitat in mature, multi-story habitat.

Although application of the NRLMD standards and guidelines is required only in habitat identified as occupied and is only to be considered when planning projects in unoccupied habitat per the NRLMD ROD, to date the HLC NF has applied them to all vegetation management projects occurring in mapped lynx habitat regardless of occupancy status. The combined impacts of past vegetation management such as timber harvest and prescribed fire, along with natural disturbances such as wildland fire and insect infestations, are reflected in the current lynx habitat status shown in Table 15. Table 19 shows more specifically the amount of potential lynx habitat affected by past (1987-2019) regeneration harvest. The information in Table 19 is divided into GAs currently considered occupied and those currently unoccupied (U.S. Department of Agriculture, Forest Service, 2006b).

Table 19 also shows, for reference and comparison, the acres of potential habitat affected by wildland fire from 1986-2018; the influence of wildland fire on lynx habitat is discussed in the next section under the heading “Wildland Fire Management”. Also, Table 19 shows the number of LAUs in each GA that currently (as of 2018) have $\geq$30% of their lynx habitat in early stand initiation structural stage that is not yet providing winter snowshoe hare habitat. Although habitat in that stage may result from disturbances other than vegetation management, Table 19 shows the number of LAUs that may not currently comply with standard VEG S1 and therefore in which regeneration type harvest would not currently be allowed without applying NRLMD exemption to the standard.

Table 19. Canada lynx potential habitat affected by past regeneration harvest or wildland fire, and number of LAUs with ≥30% potential lynx habitat in early stand initiation structural stage, by GA

Geographic area / recovery outline category	Acres potential lynx habitat	Acres (%) potential lynx habitat affected by regeneration harvest 1987-2019	Acres (%) potential lynx habitat affected[16] by wildland fire 1987-2018	Number of LAUs with ≥30% habitat in early stand initiation stage/total number LAUs
Occupied				
Rocky Mountain Range	468,177	865 (<1%)	246,956 (53%)	10/27
Upper Blackfoot	250,890	5,520 (2%)	91,040 (36%)	5/15
Divide	111,309	6,165 (6%)	196 (<1%)	0/6
Total occupied	830,376	12,550 (2%)	338,193 (41%)	15/48
Unoccupied				
Big Belts	81,724	1,613 (2%)	4,115 (5%)	0/3
Castles	28,946	262 (<1%)	0	0/2
Crazies	37,058	702 (2%)	2,718 (8%)	0/2
Elkhorns	71,895	224 (<1%)	18,317 (27%)	0/4
Highwoods	NA	NA	N/A	NA
Little Belts	429,486	13,800 (3%)	13,741 (3%)	0/22
Snowies	29,433	26 (<1%)	797 (3%)	0/2
Total unoccupied	649,351	16,627 (3%)	39,689 (6%)	0/35
Totals	***1,479,969***	***29,177 (2%)***	***377,882 (26%)***	***15/83***

Depending on varying site conditions, potential lynx habitat that experienced regeneration harvest more than 20 years ago is likely to now be in a stand initiation stage that provides winter snowshoe hare habitat, whereas habitat that has had regeneration harvest within the past 20 years may be currently be in an early stand initiation stage. The current structural condition of potential lynx habitat is reflected in Table 15 and results from both natural and anthropogenic influences.

Only the Rocky Mountain Range and Upper Blackfoot GAs have LAUs with ≥ 30% of their lynx habitat in an ESI stage. These GAs each have experienced a large amount of wildland fire in the past 30 years and relatively little regeneration harvest (Table 19); most of the ESI stage in these GAs is a result of wildland fire and occurs in designated wilderness or the Conservation Management Area, where vegetation management is prohibited or highly constrained by those designations.

The NRLMD allows pre-commercial thinning (exception to standard VEG S5) or treatments in mature, multi-story habitat (exception to standard VEG S6) to meet narrowly specified resource objectives. It also allows limited exemptions and exceptions from all vegetation standards in order to carry out fuels treatments specifically designed to protect "communities at risk" within the wildland urban interface (WUI) identified in Community Wildfire Protection Plans, as defined by the Healthy Forests Restoration Act (see glossary accompanying the 2020 Forest Plan). Exemptions to the NRLMD standards in the WUI can occur on no more than 6% (cumulatively) of the occupied lynx habitat on each NF (U.S. Department of the Interior, Fish and Wildlife Service, 2017b).

When the NRLMD was signed in 2007, the FWS issued a BO that included an Incidental Take Statement (ITS) allowing a specified acreage to be treated using each exception/exception over a period of 10 years (U.S. Department of the Interior, Fish and Wildlife Service, 2007a). The ITS was reviewed and extended

[16] Habitat affected by fire may be in a variety of structural stages, depending on the intensity and severity of the fire

in 2017 for 5 years. Table 21 shows the "acres that can be treated in occupied lynx habitat … using the exemptions from the NRLMD for fuels treatment projects in the WUI … and/or the exceptions to the NRLMD for pre-commercial thinning projects for other resource benefit" (U.S. Department of the Interior, Fish and Wildlife Service, 2017b). Note the HNF and the LCNF are listed separately because the 2017 ITS carried forward estimates made in 2007 when the two forests were administratively separate. Table 20 also shows the acreage of vegetation management that the HLC NF carried out between 2007 and 2017 using the exceptions and exemptions.

Table 20. Acres of occupied lynx habitat treated between 2007 and 2017 using the exemptions and exceptions to the NRLMD vegetation standards (USFWS, 2017)

Forest	WUI Exemption	Other resource benefit exception	Total
Helena	2,507	151	2,658
Lewis and Clark	43	0	43
Total	2,550	151	2,701

For context, approximately 1,240,632 acres of the action area are within the WUI (refer to 2020 Forest Plan glossary for definition of WUI), where the fuels treatment exemptions to the NRLMD standards apply. Of those acres, approximately 572,364 acres are potential lynx habitat on NFS lands, with 200,969 acres of that in currently occupied habitat. The acreage of habitat in which fuels treatment might occur is actually much less than that total, as large amounts are within areas that are mostly unavailable to vegetation management, due to designations such as wilderness (refer to Table 18 above).

Table 21 shows the amount of lynx habitat in the 2017 ITS issued by the FWS (U.S. Department of the Interior, Fish and Wildlife Service, 2017b) for which the HNF and the LCNF may apply the exemptions and exceptions to the NRLMD vegetation standards, and includes the acres for which exemptions or exceptions have been applied to date. The HNF and the LCNF are listed separately because they are currently under separate 1986 Forest Plans.

Table 21. Acres of occupied lynx habitat available for treatment using NRLMD exemptions and exceptions

Forest	March 2017 BO amended incidental take statement acres[17]			Acres used 2017 to present		Current balance [18]
	WUI exemption	Other resource benefit exception	Maximum allowed exemption and exception	WUI exemption [19]	Other resource benefit exception	
Helena	19,047	579	19,626	655	0	18,971
Lewis and Clark	27,979	20	27,999	542	0	27,457
TOTAL	47,026	599	47,625	1,197	0	46,428

In its 2017 extension to the 2007 ITS, the USFWS observed that the amount of occupied lynx habitat treated since 2007 was well below the amount anticipated in the 2007 ITS, and therefore that continuing to use the exceptions to and exemptions from the NRLMD vegetation standards "is not likely to

[17] Current allowable take is the amount originally allowed in the 2007 ITS minus acres treated 2006-2016 (U.S. Department of the Interior, Fish and Wildlife Service, 2017b). The allowable take shown in the table applies only to occupied habitat.
[18] Current balance is the take allowed by the 2017 amended ITS minus acres treated 2017 to present.
[19] Acres used in the Tenmile South Helena project: 148 acres VEG S5, and 507 acres VEG S6.

jeopardize the continued existence of the Canada lynx." (U.S. Department of the Interior, Fish and Wildlife Service, 2017b).

Wildland fire management

Wildfire is one of the primary forces that historically shaped the structure and composition of vegetation on the HLC NF (Hann et al., 2008). The amount of wildfire occurring on the HLC NF since the 1800s has varied greatly by GA and vegetation type. Fires can alter lynx habitat by removing canopy or vegetation completely or partly, and by reverting succession such that young regenerating forests occur within some period of years after certain fires. Size, pattern, and severity of fire, along with vegetation types in which it burns, all play a role in determining the degree to which a given fire may impact lynx habitat. Fire can be both a stressor or a driver of lynx by altering foraging habitat in a way that reduces or degrades summer and winter snowshoe hare habitat, or by creating changes over time that eventually increase the amount of summer and winter snowshoe hare habitat available to lynx. Wildland fires are largely responsible for creating the "mosaic of habitat conditions through time that support … high densities of snowshoe hare" as described in the objectives in the NRLMD (U.S. Department of Agriculture, Forest Service, 2007c), as well as throughout the published literature (Squires et al., 2010).

Forest managers may influence the size, location and severity of some fires through a variety of practices that include suppression and fuels management. Many fires burn largely influenced by weather/climate, vegetation, and terrain. The location of wildfire starts is entirely outside the Forest's control. Weather and fuel conditions may have a much greater influence on fire severity and spread than any management actions that are taken.

Status and management of fire in the action area

The 1986 Forest Plans include direction to develop fire management plans, and they refer to specific fire management goals or practices based on Management Areas and/or fire management units identified in fire management plans. Current management of wildland fire is guided by plans and policies at the forest, area, and national level, all of which are frequently evaluated and updated. Wildland fire has been present on the landscape of the HLC NF to an increasing extent since the mid-1980s, particularly in designated wilderness areas.

Table 19 in the section above shows the acres of potential lynx habitat affected by wildland fire since 1987, by GA and occupied/unoccupied status. Most of the fire that has occurred in potential lynx habitat has been on the Rocky Mountain Range and Upper Blackfoot GAs, both of which have a large amount of acreage in designated wilderness, Inventoried Roadless Area, and/or Conservation Management Area. Not all acres affected by fire are regenerated or become unsuitable for use by hares or lynx. Acres affected by wildland fire may also overlap acres affected by regeneration harvest or other disturbances. Table 15 above shows the most current available information regarding the structural stage of potential lynx habitat, by GA, based on the most recent (2018) mapping effort. The information in that table reflects the combined influences of fire and vegetation management.

Habitat fragmentation

Habitat fragmentation is defined in the LCAS (Interagency Lynx Biology Team, 2013) as human-caused alterations of natural landscape patterns that result in a reduction of the total area of habitat, increased isolation of habitat patches, and impaired ability of wildlife to move effectively between those patches of habitat. Depending on the cause, fragmentation of habitat may be temporary or permanent. Fragmentation can lead to isolation of portions of a lynx population, with smaller populations potentially less resilient to natural and human-caused fluctuations in part due to decreased movement of individuals into the population. Small, isolated population segments may also be vulnerable to consequences of a limited, less diverse gene pool that could reduce long-term population fitness.

Status and management of habitat fragmentation in the action area

The NRLMD identified general potential linkage areas that may provide connectivity within and among lynx populations (U.S. Department of Agriculture, Forest Service, 2007b, 2007c). The area on the HLC NF that includes the Upper Blackfoot and Divide GAs was identified as providing large-scale, potential linkage between occupied core habitat on the Rocky Mountain Range GA and Flathead NF to the north and west, and secondary habitat to the south and west on the Divide GA and the Beaverhead Deerlodge NF. For the remainder of the HLC NF, possible linkage zones to connect secondary habitat in the unoccupied island mountain ranges were identified largely across the intervening private lands that are not subject to National Forest management actions.

The HLC NF has adhered to the 2007 NRLMD objectives, standards, and guidelines to maintain or restore lynx habitat connectivity within or among LAUs. These plan components are applied when site-specific projects or activities are planned.

Currently, the Forest has approximately 2,600 miles of authorized roads and trails across the action area for motorized and non-motorized use. Montana highways 200, 12, and 89 are major public travel corridors that separate portions of the action area where these highways occur within geographic areas. These highways represent potential fragmentation at a broad scale, among portions of the forest or among GAs. Other transportation corridors (Montana Highways 87, 287, 191 and Interstate 15) occur between geographic areas at low elevations on mixed private and state lands of various land use types. These highways may contribute to the existing isolation of the island mountain ranges that comprise the planning area.

Changes in vegetation due to fire or vegetation management also have the potential to fragment habitat temporarily, particularly within a LAU or among adjoining LAUs. Disturbances such as regeneration harvest and stand-replacing fire can create areas unlikely to be used by snowshoe hare or by lynx until those areas regrow to a structural stage that provides suitable habitat. Those areas may be used less by lynx than other structural stages, due to lack of both cover and prey, but over time succession may alter forest conditions into structural stages that provide better foraging or travel habitat for lynx. The potential effects of land management practices on lynx habitat fragmentation or linkage are best analyzed specific to the location and general area where management activities occur, as well as based on the nature and duration of the activity or use. The NRLMD reduces and/or avoids these potential effects through the ALL and LINK objectives, standards, and guidelines.

Climate change

The LCAS (Interagency Lynx Biology Team, 2013) addresses several possible effects of climate change on lynx. These include potential shifts in lynx distribution in terms of elevation and latitude, changes in hare population cycles, reductions in the amount of lynx habitat due to changes in snow suitability and persistence, and changes in the frequency and severity of disturbances such as wildfire and insects that impact habitat. McKelvey and Buotte (2018) note that maintaining connectivity within or among lynx populations may become more difficult as southern lynx populations become more isolated and as disturbance processes change. They also discuss research regarding the potential for snowshoe hares to become more vulnerable to predation as a result of pelage color moving out of synchrony with altered snowpack timing and duration. Rates and magnitude of these changes and the manner in which they may interact are difficult or impossible to predict.

Tree species that are key components of snowshoe hare, and therefore lynx habitat, including Engelmann spruce and subalpine fir, may decrease at lower elevations, possibly expand upward in elevation, and potentially become less resilient to disturbance (U.S. Department of Agriculture, Forest Service, Northern Region, 2015). This, combined with likely increased fire frequency and duration, may result in overall decreases in high-quality lynx foraging habitat. For the portions of the Forest on the edge of current and historic lynx distribution, lynx habitat could decrease to the point that portions of the plan area that currently support lynx either permanently or as transients are no longer capable of doing so. Areas where

habitat is limited or marginal, such as at the edge of a species' distribution may be the first areas to become uninhabited (Brown, Stevens, & Kaufman, 1996).

Climate change could have the potential to alter the amount and distribution of lynx habitat in the action area across all land ownership types. Coupled with fire suppression, climate change can increase the impact of insects and disease and change the amount of habitat available to lynx. Climate change may impact the amount and persistence of deep fluffy snow for use by lynx in the winter period; this deep fluffy snow may become more limited in suitable elevations as predicted in some future climate scenarios. These changes in snow condition could alter the predator-prey relationship between lynx and snowshoe hare (Squires et al., 2010) potentially impacting lynx numbers and distribution.

Climate change-related management in the action area

The Lynx Strategy states, "… federal agencies may be limited in actions that can be taken to ameliorate these [climate change] effects." (Interagency Lynx Biology Team, 2013). 1986 Forest Plans do not contain measures specifically related to climate change, nor does the NRLMD. The guidance in the NRLMD, however, is directed toward managing boreal forest habitat in such a way as to conserve and recover Canada lynx independent of future climate scenarios.

Second tier anthropogenic influences

Second-tier influences identified in the Lynx Strategy and shown in Table 16 include recreation (including trapping), mineral and energy exploration and development, roads and trails, and livestock grazing. Table 17shows the total acreage of mapped potential lynx habitat in which various uses, including livestock grazing, motorized and mechanized travel and others could occur. As with other uses, the table shows the total acreage where uses could be allowed, but site-specific planning and analysis determines the actual extent and acreage where those uses occur. Recreation occurs across the entire Forest, and it is guided by area-based and site-specific designations and recreation settings (see "Recreation").

Existing uses were analyzed in the programmatic consultations that occurred when Canada lynx was listed and when the NRLMD was amended to Forest Plans, as previously described. These uses are described briefly below; their impacts are assumed to be the same as those analyzed in the prior consultations.

Livestock grazing

There are 240 active allotments on the HCL NF, on 1,355,143 acres of NFS lands. Of those, 356,816 acres are in GAs considered currently occupied by Canada lynx. The HLC NF permits use by 24,190 cattle, 79 horses, and 5,000 sheep, for an average of 86,015 cattle head months (one month's occupancy and use by one animal), 122 horse head months, and 8,648 sheep head months. Grazing operations occurring in occupied habitat must comply with objectives and guidelines in the NRLMD that direct managers to limit impacts to regenerating trees and shrubs and to aspen stands (GRAZ G1 and GRAZ G2), maintain certain habitat components used by lynx, in the stages or quantities that would have occurred under historic disturbance regimes (GRAZ G3 and GRAZ G4) (U.S. Department of Agriculture, Forest Service, 2007c). Overall, grazing should be made compatible with improving or maintaining lynx habitat (GRAZ 01). This management direction is also considered when managing grazing operations in lynx habitat that is currently unoccupied.

Minerals (leasable and locatable)

The entire Rocky Mountain Range GA, which comprises 468,177 acres of occupied potential lynx habitat and represents the majority of designated Canada lynx critical habitat on the HLC NF, is permanently withdrawn from future locatable or leasable minerals exploration or development. That GA contains two existing leases that are currently suspended pending the outcome of litigation. The only commercial mining rights on the HLC NF are in the Upper Blackfoot GA, also within occupied and designated critical

habitat. There are 9 lease parcels in currently unoccupied habitat (8 in the Big Belts GA and one in the Crazies GA shared with the Custer-Gallatin NF), all of which are suspended pending further review and decision.

Decisions about leasing or permitting areas for minerals exploration or development are not made at the Forest Plan level and are tied to other processes occurring separately and subject to specific laws and regulations. Forest plans guide the specific manner in which the activities allowed by minerals leases or permits are carried out on the ground.

Minerals and energy development in occupied lynx habitat is subject to the standards and guidelines in the NRLMD, including Objective HU O5 to manage these uses so as to reduce impacts to lynx and lynx habitat, and guidelines to reduce potential snow compaction associated with minerals and energy development (HU G4 and HU G12), reclaim sites so lynx habitat is restored (HU G5), and minimize impacts due to roads (HU G6 – G9). These plan components are to be considered when minerals or energy development is planned in unoccupied habitat.

Recreation

Recreation on the HLC NF encompasses a large array of activities, from wilderness camping and hiking, to alpine skiing, motorized trail riding, fishing, and more. Recreation is managed by making site-specific decisions about types of opportunity, facilities, or access, and by administration of permits for special uses such as outfitting and guiding, lodges, residences, and others. These site-specific decisions are guided by recreation settings that describe types of desired or allowable uses in an area. Recreation on the HLC NF is also influenced by numerous area designations that define or limit types of activities occurring within them; these designations include Congressionally-designated wilderness, wilderness study act areas, RWAs, IRAs, eligible wild and scenic rivers, scenic byways, recreation areas, and others (refer to Table 18). The NRLMD includes a number of objectives and guidelines related to recreation in lynx habitat (OBJ HU O1 –O4, GDL HU G1-G3, HU G10-11) all of which are intended to limit potential effects to lynx of various recreational activities.

Approximately 361,680 acres of occupied potential lynx habitat is in Congressionally designated wilderness. In addition to the limits on vegetation management described in that section above, other human uses are constrained in these areas. Motorized and mechanized uses, including motorized over-snow travel, are not allowed, and recreation management focuses on providing primitive experiences where the presence of humans is minimized. Additional designations, including RWAs, the Rocky Mountain Front Conservation Management Area, research natural areas, and others similarly constrain certain activities.

There are two developed alpine ski areas on the HLC NF, both on the Lewis and Clark portion of the forest. Both areas were included in the consultation for ongoing ski area activity that was completed in 2000 after lynx were listed as threatened. Teton Pass Ski Area on the Rocky Mountain Range GA is in occupied, critical habitat. The other ski area, Showdown, on the Little Belts GA is in unoccupied lynx habitat.

Winter recreation activities are guided on the HLC NF by the human use projects (HU) objectives and guidelines in the NRLMD, which are applied or considered at the time of specific management planning and analysis.

Hunting and trapping occur on NFS lands but are regulated by state law and are under the jurisdiction of Montana Fish, Wildlife and Parks. Although incidental lynx trapping may occur, it appears to have declined since protective regulations were put in place (U.S. Department of the Interior, Fish and Wildlife Service, 2017c) . Hunters and trappers may access hunting or trapping grounds via forest motorized and non-motorized routes and trails.

Environmental consequences

Analysis approach

The proposed action for the 2020 Helena-Lewis and Clark National Forest Land and Resource Management Plan is a framework programmatic action establishing goals, desired conditions, objectives, guidelines, and standards under which activities will later be planned, analyzed, and implemented. This action will place the newly combined forests under the management of a single land and resource management plan, where it was previously under two separate plans.

The proposed action is a framework programmatic action that does not authorize any specific actions. Rather, it establishes the sideboards for allowable activities throughout the life of the plan. As such, there would be no direct nor specific environmental consequences associated with the proposed action. Analysis of the effects of this framework programmatic action, therefore, is based on the potential effects of implementing an overarching management program as a whole and is necessarily broad in its approach. Site-specific activities that occur as allowed by the proposed action could have direct effects to lynx or their habitat or to other resources, but those can be predicted only after specific project proposals are developed. Site-specific analysis and consultation for projects developed under the guidance of the proposed action will occur when those projects are planned and proposed.

Effects to lynx and lynx habitat resulting from the proposed action and its plan components are described below in terms of the anthropogenic factors affecting Canada lynx (Interagency Lynx Biology Team, 2013) to parallel the affected environment discussion.

Summary of plan content

The 2020 Forest Plan Alternative F identifies allowable uses by establishing desired conditions for certain uses, by identifying suitability of certain areas for certain uses, and by designating certain areas where specific uses are to be emphasized or restricted. Table 22 shows the uses allowed in the 2020 Forest Plan, Alternative F for the combined HLC NF, along with the same information for the 1986 Forest Plans to allow comparison. As previously noted, Table 22 shows the maximum area in which those uses could be allowed, but actual acreage where uses occur would be much smaller and would be determined through site-specific project planning, analysis, and section 7 consultation.

Table 22. Acreage of uses allowed under the 2020 Forest Plan, compared to the 1986 Forest Plans, within potential lynx habitat

Allowable uses under the preferred alternative	2020 Forest Plan acres occupied habitat	1986 Forest Plans acres occupied habitat	2020 Forest Plan acres unoccupied habitat	1986 Forest Plans unoccupied habitat
Timber harvest	318,107	338,604	448,488	422,213
Timber production	62,480	70,653	126,953	156,619
Livestock grazing	178,134	178,134	356,816	356,816
Wheeled motorized	133,419	130,464	347,360	348,549
Over-the-snow motor vehicle	193,951	203,590	316,692	329,375

The 2020 Forest Plan includes desired conditions for various uses and resources and establishes constraints to be applied when planning and implementing uses and activities, in order to help achieve or move toward desired conditions. The 2020 Forest Plan also includes some plan components that are specific to GAs (Figure 1), which are defined landscapes with identifiable characteristics (e.g., island mountain ranges, areas separated by significant features, etc.). Forestwide plan components are applied on all GAs and are only superseded by GA-specific components if the GA components specifically state that is the case. Refer to the “Description of the Preferred Alternative – Alternative F” for more detail

regarding the proposed action and refer to appendix A for the 2020 Forest Plan components referenced herein.

The 2020 Forest Plan retains in its entirety the Northern Rockies Lynx Management Direction (NRLMD) (U.S. Department of Agriculture, Forest Service, 2007c) and its goals, objectives, guidelines, standards, and monitoring requirements. The Record of Decision (ROD) for the NRLMD states that its direction is to be applied on NF System land "presently occupied by Canada lynx" (ibid) as defined by the amended Lynx Conservation Agreement (U.S. Department of Agriculture, Forest Service, 2006b); see Figure 1. The ROD also states that the direction in the NRLMD should be considered when forests are "designing management actions in unoccupied mapped lynx habitat…, especially the direction regarding linkage habitat", but that they "are not required to follow the management direction until such time as they are occupied" (ibid). The NRLMD provides for the conservation of lynx habitat in occupied areas and, when applied in unoccupied areas as it has been to date on the HLC NF, promotes conservation of lynx habitat for use by transient lynx as they move through those areas. The NRLMD addresses vegetation management, human use activities and projects (special uses, livestock grazing, recreation, motorized access and use, mineral and energy development, etc.), linkage areas, and general management direction that applies to all management activities as they relate to lynx conservation and management.

In addition to the NRLMD, the 2020 Forest Plan includes guidance both directly and indirectly related to management of Canada lynx habitat. Forestwide plan components would provide for Canada lynx habitat in both occupied and unoccupied GAs, and include the following:

Plan components that apply forestwide (occupied and unoccupied lynx habitat)

- FW-VEGT-DC-01: Vegetation occurs across the landscape in a diverse pattern of compositions and structures within the natural range of variation that are resilient to future climates and disturbances such as fire, insects, disease, invasive species, floods, and droughts… The spruce/fir cover type includes dense, multistoried stands that provide high quality multistory lynx habitat…
- FW-VEGT-DC-03: Vegetation conditions provide habitat requirements to support populations of species of conservation concern, threatened or endangered species, and other native and desired non-native species based upon the inherent capability of lands.
- FW-VEGF-GDL-05: Vegetation management projects should retain at least the minimum amount of coarse woody debris (greater than or equal to 3" in diameter) …, averaged for each treatment unit on forested sites, to provide for well-distributed coarse woody debris that contributes to nutrient cycling, structural diversity, and habitat. The requirement should be met immediately following completion of all project activities… Cool moist and Cold R1 broad potential vegetation types: 10 tons/acre…
- FW-WL-DC-
  - 01: Habitats for native wildlife species are available throughout those species' potential natural ranges on NFS lands.
  - 02: Vegetation composition, structure, and distribution, including live vegetation and such things as fire or insect-killed trees, provide the life/natural history requirements of native and desired nonnative wildlife species, for the portion of those species' life cycles that occur on NFS lands…
  - 03: Vegetation composition, structure, and distribution, allow wildlife to move within and between NFS parcels in response to seasonal habitat needs, dispersal needs, disturbances (such as, fire, insect infestations), and long-term changes (such as climate change) …
  - 09: In lynx habitat (see glossary), boreal forest and associated matrix habitat provide the mosaic of structural stages necessary (as defined by the best available scientific information) to support the denning, foraging, resting, and travel habitat needs of Canada lynx.
- FW-WL-GO-04: Linkage areas identified through interagency coordination facilitate the movement of wildlife between NFS parcels separated by other ownerships.

Additional GA-specific plan components would apply in GAs that are currently considered occupied by lynx and would provide further measures to maintain lynx habitat and connectivity when projects and other management actions are planned in those areas. Those plan components are:

Plan components specific to occupied lynx habitat

- DI-VEGF-DC-04: Lynx habitat (see glossary) provides the amount, distribution, and structural conditions (based on the best available scientific information), at the scale of a reproductive female lynx home range, necessary to support the recovery and persistence of Canada lynx in the plan area.
- DI-WL-DC-01: The Divide landscape provides habitat connectivity for wide-ranging species (grizzly bear, Canada lynx, wolverine, and others) between public lands in northern Montana and those in south and southwestern Montana, including lands in the Greater Yellowstone Ecosystem.
- RM-VEGF-DC-04: Lynx habitat (see glossary) provides the amount, distribution, and structural conditions (based on the best available scientific information), at the scale of a reproductive female lynx home range, necessary to support the recovery and persistence of Canada lynx in the plan area.
- RM-WL-DC-01: The Rocky Mountain Range GA provides habitat connectivity for wide-ranging species (grizzly bear, Canada lynx, wolverine, and others) between public lands in northern Montana and those in central and southern Montana, including lands in the Greater Yellowstone Ecosystem.
- UB-VEGF-DC-04: Lynx habitat (see glossary) provides the amount, distribution, and structural conditions (based on the best available scientific information), at the scale of a reproductive female lynx home range, necessary to support the recovery and persistence of Canada lynx in the plan area.
- UB-WL-DC-01: The Upper Blackfoot GA provides habitat connectivity for wide-ranging species (grizzly bear, Canada lynx, wolverine, and others) between public lands in northern Montana and those in central and southern Montana, including lands in the Greater Yellowstone Ecosystem

Discussion of specific plan components or designations of allowable uses made in the proposed action will follow as they relate to the various factors that influence lynx and their habitat.

Effects of the proposed action on factors affecting Canada lynx in the action area

This biological assessment considers the effects to Canada lynx and its habitat from implementation of the 2020 Forest Plan as guided by its plan components, including desired conditions, standards, and guidelines for the planning area. This analysis and subsequent discussion address specific plan components targeted for Canada lynx and its habitat, as well as key plan components not targeted for lynx and its habitat but that have the potential to affect lynx and its habitat.

Vegetation management

Allowable uses

Timber production (the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut … for industrial or consumer use; see glossary in proposed action), could potentially be allowed on 62,480 acres of currently occupied and 126,953 acres of currently unoccupied potential lynx habitat (Table 22). This is a decrease of roughly 3% of occupied habitat and a decrease of roughly 4% of unoccupied habitat in which timber production could potentially be planned and implemented. Within occupied habitat the plan components in the NRLMD would be applied to any activities related to timber production and would be considered in planning those activities in unoccupied habitat.

Timber harvest (removal of trees for varied purposes) could potentially be allowed on 318,107 acres of currently occupied and 448,488 acres of currently unoccupied potential lynx habitat (Table 22). This is a decrease of roughly 3% of occupied habitat and an increase in roughly 4% of unoccupied habitat in which timber harvest could potentially be planned and implemented. Within occupied habitat, the plan components in the NRLMD would be applied to any activities related to timber harvest, and the NRLMD would be considered in planning those activities in unoccupied habitat.

Table 23 shows the amount of the action area within or proposed for particular management designations. Wilderness areas, wilderness study areas, IRAs, and the conservation management area are designated by Congress and are therefore the same as previously described. RWAs and research natural areas are established in the Forest Plan.

Table 23. Designated areas identified in the proposed action and potential lynx habitat by occupancy

Designated area	Acres *occupied* potential lynx habitat	Percent of occupied potential lynx habitat	Acres *unoccupied* potential lynx habitat	Percent of unoccupied potential lynx habitat
Congressionally Designated				
Wilderness areas	361,680	45%	10,032	1%
Wilderness study areas	0	0%	77,973	11%
Inventoried roadless areas	322,164	40%	410,242	60%
Conservation management area	68,442	9%	0	0%
Administratively designated in preferred alternative				
Recommended wilderness areas	51,441	6%	27,713	4%
Research natural areas	2,246	<1%	4,536	<1%
South hills recreation area	17,880	2%	0	0%
Grandview recreation area	0	0%	8,932	1%
Green timber botanical area	214	<1%	0	0%

Effects to lynx and lynx habitat as a result of wilderness, wilderness study act areas, and IRA designations are as described in the analysis for the NRLMD (U.S. Department of Agriculture, Forest Service, 2007c) (U.S. Department of Agriculture, Forest Service, 2007b) (U.S. Department of the Interior, Fish and Wildlife Service, 2007b) (Conway & Hanvey, 2017; U.S. Department of the Interior, Fish and Wildlife Service, 2017b) and as previously described. Management of these areas would provide lynx large expanses of habitat free from development where natural processes would be the primary drivers of vegetation conditions.

The proposed action would increase the amount of potential lynx habitat in administratively designated areas by increasing the acres of RWAs (adding 37,888 acres of potential lynx habitat), and by adding an additional research natural area, a botanical area, and two recreation emphasis areas (Table 23). Management direction for RWAs and research natural areas prohibits most vegetation management actions. Those areas, however, co-occur with additional designations, such as IRAs, that are not made at the Forest Plan level and occur in the 1986 Forest Plans as well. Therefore, this increase would likely not measurably change the amount of potential lynx habitat in which vegetation management actions would be prohibited, constrained, or allowed.

Desired conditions

Desired conditions establish the vegetation composition, structure, and function to support ecological integrity, which includes providing habitat for native plant and animal species. All management actions, including those associated with timber production, harvest, prescribed burning, and others must either move vegetation structure and composition toward the desired conditions, or not preclude achieving those conditions.

The 2020 Forest Plan includes desired conditions to be applied at a forestwide scale in support of lynx habitat. These desired conditions state that vegetation will provide the habitat requirements to support threatened and endangered species (FW-VEGT-DC-03), including specifically Canada lynx at the scale of

a female home range (FW-WL-DC-09), and provide habitat connectivity (FW-VEGT-DC-04, and FW-WL-GO-04). The 2020 Forest Plan also includes GA-specific direction for the Rocky Mountain Range, Upper Blackfoot, and Divide GAs, all of which are core habitat (U.S. Department of the Interior, Fish and Wildlife Service, 2005b) and are currently considered occupied (U.S. Department of Agriculture, Forest Service, 2006b). DI-VEGF-DC-04, RM-VEGF-DC-04, and UB-VEGF-DC-04 direct managers to move toward conditions that provide for the amounts, distributions, and structural conditions of spruce and fir that will provide quality lynx habitat in those GAs.

The 2020 Forest Plan includes desired conditions for vegetation that are based on the estimated NRV for each broad PVT, which specify that:

- In the cool-moist PVT, the spruce/fir type includes high quality multistoried lynx habitat (FW-VEGT-DC-01) and increases toward the estimated NRV (FW-VEGT-DC-02).
- In the cold PVT large spruce and fir are promoted on productive sites (FW-VEGT-DC-01).
- In the cool-moist PVT, both Engelmann spruce and subalpine fir desired conditions would move presence of those tree species toward the estimated NRV (FW-VEGF-DC-01), which would mean maintaining current abundance or allowing slight decrease of spruce at a forestwide scale, and maintaining or increasing fir abundance at that scale.
- Across all PVTs, desired conditions guide managers to maintain or move toward a mix of successional stages and structural components that approximate the estimated NRV (FW-VEGT-DC-01, FW-VEGF-DC-02 through 07).

These desired conditions would apply to the specified PVTs where they occur across the entire action area and would be measured across the entire forest. Desired conditions may not necessarily be achieved at the scale of individual GAs, LAUs, or within a specific project area. This means that when projects are planned in potential lynx habitat, desired conditions and other plan components that direct managers to maintain or restore lynx habitat would usually take precedence over those that could otherwise reduce lynx habitat.

The effects of implementing the desired conditions in the 2020 Forest Plan would be to move vegetation toward the estimated NRV in terms of the amount and distribution of vegetation types and structural stages at a forestwide scale, and to maintain or restore lynx habitat, particularly in areas identified as core habitat. The NRV is presumed to approximate the historic habitat conditions under which lynx evolved. Desired conditions, however, are applied when specific projects are planned and implemented, guiding the location, design, methods, and other aspects of implementation. Therefore, effects to lynx and lynx habitat would only occur after site-specific actions are planned and implemented following appropriate analysis and section 7 consultation. Until that occurs, there are no actions that would occur that would have direct or indirect effects on lynx.

Standards and guidelines

2020 Forest Plan

The 2020 Forest Plan includes standards and guidelines that would support desired conditions by requiring or constraining certain vegetation management practices. These would occur across the entire HLC NF, and include:

- Standard FW-TIM-STD-04: On lands both suitable and unsuitable for timber production, clearcutting shall be used as a harvest method only where it has been determined to be the method most appropriate to meet the purpose and need of the project. Other types of even-aged harvest shall be used only where determined to be appropriate. Determinations shall be based on an interdisciplinary review of site conditions and the desired conditions for vegetation, wildlife habitat, scenery, and other resources.

- Standard FW-TIM-STD-08: The maximum opening size created by clearcutting, seedtree cutting, shelterwood seed cutting, or other cuts designed to regenerate an even-aged stand of timber in a single harvest operation shall normally be 40 acres. This standard applies to new harvest proposals on NFS lands only and need not consider existing openings on NFS lands, adjacent private or other agency lands. An exception applies to achieve desired ecological conditions for the plan area, including those associated with forest patterns, patch sizes and resilience in the short and long term (FW-VEGT-DC-01, 04 and FW-VEGF-DC-08, 09). The maximum opening size exception for the HLC NF is 75 acres. This is consistent with the estimated natural range of variation for average patch size of early successional forest openings.
- Guideline FW-TIM-GDL-01: To contribute to ecological sustainability and ecosystem health, when timber harvest and maintenance activities (such as precommercial thinning) are conducted, they should be designed to move the Forest toward achievement of vegetation desired conditions (such as species composition, size class, forest density, and landscape pattern) as well as other resource desired conditions.

The overall effect of these standards, when applied to project actions, would be to limit the size of regeneration harvest and the frequency at which it may occur. Depending on site-specific forest conditions, these limitations may either promote or limit snowshoe hare and/or lynx habitat by retaining winter snowshoe hare habitat in stand initiation and multi-story stands or precluding treatment in stands that do not provide winter snowshoe hare habitat where such treatment could benefit these stands and habitat conditions for lynx. At a forestwide scale, by limiting the size and distribution (both spatial and temporal) of regeneration harvest to the estimated NRV, these standards would contribute over time to a mosaic of habitat conditions that would provide dense horizontal cover in young, regenerating forests as well as patches of mature, multi-story conifer vegetation.

Northern Rockies Lynx Management Direction

The 2020 Forest Plan retains the objectives, goals, standards, guidelines, and monitoring requirements in the NRLMD ROD, as previously described. The direction in the NRLMD would be applied to projects occurring in occupied lynx habitat and considered when management activities are planned in unoccupied lynx habitat. The guidance in the NRLMD is intended to minimize negative impacts of management actions to key lynx and hare habitats by restricting certain types and amounts of vegetation management that can occur there.

Exceptions to standard VEG S5 allow pre-commercial thinning to meet other resource objectives in specifically defined situations. Also as described above, fuels treatment projects occurring in the WUI may be exempt from the NRLMD vegetation standards, as long as no more than 3 adjacent LAUs exceed the structural stage limit established in standard VEG S1, and as long as treatments using those exemptions do not occur on more than 6% (cumulatively) of the occupied lynx habitat on each NF.

In its BO on the NRLMD, the Service issued an ITS identifying the maximum acreage that could be treated using each exception/exemption, over a period of 10 years (see Table 21), as a surrogate measure for take. The ITS was extended in 2017 for 5 years, based on acreages of treatment allowed in the initial ITS and subtracting what had been treated using the exemptions/exceptions through 2017.

As a part of this plan revision effort, the HLC NF has updated its estimate of acres that may be treated and that would be subject to the NRLMD exemptions and exceptions. This estimate considered objectives in the proposed action (FW-FIRE-OBJ-01; refer to Appendix A), management constraints in the plan (including standards and guidelines in the NRLMD), and the amount of potential lynx habitat occurring in the WUI as identified by Community Wildfire Protection Plans (refer to the project record for additional details). Not all acres to be treated in the WUI would occur in occupied potential lynx habitat. The 15,000 acres identified in FW-FIRE-OBJ-01 is a minimum objective to be treated per decade; the Forest

estimates that up to 39,823 acres of occupied potential lynx habitat could be treated in the WUI using the exemptions in the NRLMD over the life of the plan (Table 24), which is expected to be 15 years. Similarly, the Forest estimates that up to 40,732 acres of unoccupied habitat in the WUI could be treated over the life of the plan.

The 2020 Forest Plan also includes an objective (FW-PLANT-OBJ-01) to treat a minimum of 4,500 acres to sustain or restore whitebark pine; treatments could include pre-commercial thinning, as described in the exception to NRLMD Standard VEG S5. This number could be higher, as the objective is a minimum that would be accomplished over the life of the plan. Managers estimate that an additional 3,500 acres could be treated using the exception to NRLMD standard VEG S5 for the following purposes 1) Within 200 feet of administrative sites, dwellings, or outbuildings 2) for research studies or genetic tree tests evaluating genetically improved reforestation stock 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 that a project is not likely to adversely affect lynx or 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 4) for conifer removal in aspen, or daylight thinning around individual aspen trees, or where aspen is in decline. The forests anticipate the large majority of acres of lynx habitat treated using VEG S5 would be for the purposes of restoring or sustaining whitebark pine and aspen. Since aspen is difficult to geospatially predict or map, and- thus to enumerate in acres across the action area, we assume that the majority of the additional 3,500 acres described above would be available for the treatment of aspen, with a minor amount of acres treated for the remaining reasons detailed above as allowed under VEG S5. The exact number of acres treated for each purpose is not currently known and would be determined as projects are developed according to identified, site-specific needs.

The total use of the exceptions to VEG S5 are not anticipated to exceed 4,800 acres in areas occupied by lynx. We estimate that within areas occupied by lynx 2,700 acres of lynx habitat may be treated for the purposes of restoring whitebark pine, and 2,100 acres for restoring aspen. Since the forest cannot anticipate at this time how many acres of habitat would be treated using the other exceptions to VEG S5 (detailed above, not including whitebark pine and aspen), the Forest will not exceed 4,800 acres treatment of habitat occupied by lynx using VEG S5 for any purpose throughout the life of the plan (Table 24).

Similarly, the total use of the exceptions to VEG S5 are not anticipated to exceed 3,200 acres in areas unoccupied by lynx. We estimate that within areas unoccupied by lynx 1,800 acres of lynx habitat may be treated for the purposes of restoring whitebark pine, and 1,400 acres for restoring aspen. Since the forest cannot anticipate at this time how many acres of habitat would be treated using the other exceptions to VEG S5 (detailed above, not including whitebark pine and aspen), the Forest will not exceed 3,200 acres treatment of habitat unoccupied by lynx using VEG S5 for any purpose throughout the life of the plan.

Table 24 shows the maximum acres and percent of occupied potential lynx habitat anticipated for treatment, based on objectives in and analysis for the 2020 Forest Plan, in which exceptions for pre-commercial thinning and exemptions for fuels treatment projects in the WUI could be used.

Table 24. Acres of occupied potential lynx habitat anticipated for treatment using exceptions to and exemptions from the NRLMD

Total acres potential lynx habitat	Acres occupied potential lynx habitat	Total acres potential lynx habitat in WUI	Acres occupied potential lynx habitat in WUI	Current balance acres from 2017 ITS[20]	Acres anticipated treatment under the proposed action[21]	
					WUI exemption[22]	Resource benefit exception[23]
1,479,727	830,376	570,694	200,969	46,428	45,023	4,800

The acres of anticipated treatments shown in Table 24 are a maximum that could be treated over the anticipated life of the plan (15 years) in habitat currently identified as occupied. Although the 2020 Forest Plan includes numeric objectives for fuels and other vegetation treatments, it does not plan nor authorize those treatments. Specific projects to achieve numeric objectives, as well as desired conditions would be planned and analyzed and would undergo appropriate section 7 consultation. The objectives in the proposed action, and the estimates in Table 24, provide a means to estimate the amount of lynx habitat on which such projects could potentially be planned over the life of the plan.

Fuels treatments and other actions described above would occur on less than 1% of potential lynx habitat across the entire action area, distributed in small acreages over a large area, and would occur incrementally over the life of the plan. The acres anticipated for treatment in Table 24 are greater than the minimum objective identified in the proposed action, which is a forestwide objective that includes both occupied and unoccupied lynx habitat. The Service noted that the Forest Service had not come close to treating the entire number of acres allowed in the previous ITS. Similarly, it is reasonably likely that the HLC NF would not treat the entire acreage shown in Table 24 during the anticipated life of the plan.

Approximately 200,969 acres (24% of the Forest's total) of occupied and 371,393 acres (55% of the Forest's total) of unoccupied potential lynx habitat on the HLC NF is within the WUI. Fuels treatment would occur in unoccupied lynx habitat; the Forest estimates that up to roughly 40,727 acres of unoccupied potential lynx habitat could be treated in the WUI over the life of the plan. Because the NRLMD is to be considered in unoccupied habitat but its application is not required there, potentially negative impacts to lynx habitat may not be limited to those resulting from use of exemptions and exceptions to the NRLMD standards and guidelines. The FWS stated in its 2017 amended ITS (U.S. Department of the Interior, Fish and Wildlife Service, 2017b), however, that "lynx habitat in unoccupied secondary areas is often of inherently lower quality" and those areas are "relatively isolated from other blocks of lynx habitat". They concluded that "The incidental take of lynx… in currently unoccupied secondary habitat would be low to none." (ibid), indicating that the amount and type of vegetation management occurring to date in those areas was insignificant and/or discountable to lynx. When planning projects in unoccupied lynx habitat, however, the standards and guidelines in the NRLMD would be considered; to date the HLC NF has applied those components to all vegetation management projects in unoccupied habitat. Additionally, all other forestwide plan components described above would be applied during the planning and implementation of any vegetation management projects in lynx habitat regardless of whether it is considered occupied or unoccupied. Thus, the 2020 Forest Plan, through its

[20] Acres here represent the difference in the sum of both forests' take as outlined in the amended 2017 incidental take statement and biological opinion minus what has been used from that issuance to October 2019.
[21] Occupied lynx habitat only.
[22] Includes exemptions to standards VEG S1 and VEG S2.
[23] Includes exceptions to standard VEG S5. VEG S6 is assumed to be included in amounts so minor at the programmatic scale, unable to be predicted here, and effects that would be insignificant as to be indistinguishable from the natural stressors to lynx; therefore, it is not enumerated here. The use of VEG S6 will be analyzed and consulted on at the project level.

emphasis on desired conditions to achieve NRV, and forestwide plan components regarding at-risk species (e.g., FW-VEGT-DC 03) and specifically Canada lynx (FW-WL-DC-09), provides more direction for managers to conserve lynx habitat in unoccupied as well as occupied areas than is present in the 1986 Forest Plans.

At the scale of the proposed framework programmatic action, the plan components previously discussed would guide the Forest to provide for spruce-fir, moist Douglas-fir, and lodgepole forests, their structural composition, continuity, and juxtaposition to other habitat within the estimated NRV that lynx may use for feeding, breeding and sheltering. These plan components would be applied at the project scale, along with consideration of other science e.g. (Holbrook et al., 2018; Holbrook et al., 2019; Joseph D. Holbrook et al., 2017; J. D. Holbrook et al., 2017; Megan K. Kosterman et al., 2018) during planning, consultation, and implementation to provide for the habitat components required to sustain lynx and their prey.

Effects of vegetation management

The 2020 Forest Plan is a programmatic decision and does not authorize any direct, site-specific vegetation management in the planning area. Therefore, the effects to lynx and its habitat that may result from implementing the framework, programmatic plan can only be discussed here in broad, general terms. Direct effects that would result from implementation of vegetation management activities cannot be predicted until those projects are planned and specific locations and habitats where activities would occur are known. Specific effects to lynx and lynx habitat would then be analyzed and discussed at the project level during the project section 7 consultation process.

Vegetation management activities allowed in the proposed action could alter, remove, or potentially degrade lynx habitat in spruce-fir and moist Douglas-fir forests where live vegetation and tree boughs are available for use by snowshoe hare during summer and winter periods. This may result from the application of vegetation treatments as allowed in the revised plan; those treatments could include timber harvest and production, precommercial thinning, fire use for vegetation management purposes, girdling of trees, other mechanical removal of vegetation, and other such methods that kill, destroy, remove, or manipulate trees and other vegetation to achieved desired conditions.

The alteration, removal, and degradation of this habitat may affect Canada lynx by reducing horizontal vegetation that snowshoe hare rely on for foraging and sheltering, and that consequently lynx use to forage for hares. Vegetation management may reduce an area's ability to provide snowshoe hares for lynx; however, application of the above described plan components may mitigate or avert some potential effects, so that impacts to lynx that result from implementing the plan would be limited in both space and time.

Adverse effects to lynx may occur as a result of vegetation management occurring in occupied lynx habitat where lynx are resident, but adverse effects are not expected in unoccupied areas. The effects to lynx in unoccupied areas are likely to be insignificant because secondary and peripheral (unoccupied) areas are not likely to support lynx home ranges or reproduction over time (Interagency Lynx Biology Team, 2013). Secondary areas contain boreal forest types, but those forests may be inherently patchier and/or drier and have snow or habitat conditions that are not favorable to lynx (ibid). In peripheral areas habitat may occur in small patches not well connected to larger patches of high-quality habitat (ibid); island mountain ranges are often identified as peripheral because of their size and lack of connection to other areas of lynx habitat (ibid). Peripheral areas "are considered to be incapable of supporting self-sustaining populations of lynx" (ibid). It is possible that secondary and peripheral areas may play a role in sustaining lynx populations during times of population fluctuation (ibid), but that possibility remains unclear and speculative.

The BO and amended ITS issued to Region 1 USFS by the Service in March 2017 shows a combined amount of treatment that could be carried out under the NRLMD at the project level by both the former Helena and former Lewis and Clark NFs, totaling 47,625 acres (U.S. Department of the Interior, Fish and

Wildlife Service, 2017b). The Forest (now combined) anticipates these treatments as allowed under the exemptions and exceptions to vegetation standards in the NRLMD to total 49,823 acres of occupied lynx habitat. This represents an increase in the amount of treatment by 2,198 acres, or an increase of approximately 0.05 % from the combined forest's acres in the March 2017 amended incidental take statement. Considering the amount of occupied lynx habitat that would not be available for treatment using these exemptions and exceptions (approximately 780,553 acres), and the very minor amount of occupied habitat that has been treated by the Forest since the first issuance of an ITS for use of the NRLMD (3,853 acres), this increase represents only a very small portion of occupied potential lynx habitat available for treatment. While this increased treatment in occupied habitat could be adverse to individual lynx through the removal of snowshoe hare habitat, the overall effect of this increase in anticipated treatment across the action area would be insignificant because of the small proportion of habitat available for treatment, not all of which would be treated at any one time or place. Nonetheless, the updated figure means that there would be slightly more lynx habitat anticipated for treatment throughout the life (estimated 15 years) of this federal action.

Wildland fire management

The 2020 Forest Plan states that fire management will strive to balance the natural role of fire while minimizing the impacts from fire on values to be protected. All wildfire management decisions will be made with the primary consideration given to both the health and safety of the public and of fire personnel.

Desired conditions

Desired conditions in the 2020 Forest Plan establish that naturally occurring fire would continue to be a primary driver of ecosystem processes on much of the Forest (FW-FIRE-DC-01).

Standards and guidelines

Guidelines in the proposed action guide managers to create conditions in which fire can play its natural ecological role (FW-FIRE GDL-02). In certain areas, however, wildfire would be managed to protect resources at risk (FW-FIRE-DC-02; GO-02; GDL-01; GDL-03). Management of fuels would occur in some areas, particularly in the WUI, in order to manage fire and fire risk (FW-FIRE-DC-02 and 03, GO-03, and OJB-01); refer also to Vegetation Management section above for some discussion of potential fuels management.

By guiding managers to allow fire to play its natural ecological role as much as possible, the proposed programmatic plan would set direction to support the natural processes that maintain the mosaic of seral stages that create lynx foraging habitat. Emergency consultation will occur using established procedures as needed when suppression activities occur in areas where lynx are present or may be present.

Effects of wildland fire management

The 2020 Forest Plan is a programmatic decision and does not authorize any direct, site-specific wildland fire management in the planning area. Thus, the effects to lynx and its habitat that may result from implementing the plan at the programmatic scale will be discussed in broad general terms. Specific effects to lynx and lynx habitat would be analyzed and discussed during such times when wildland fire management actions present a potential affect to lynx and its habitat.

Wildland fire management activities allowed in the proposed action have the potential to alter, remove, or degrade lynx habitat in spruce-fir and moist Douglas-fir forests where live vegetation and tree boughs are available for use by snowshoe hare during summer and winter periods and where downed woody debris provides denning habitat for lynx. These changes may result from wildland fire use and suppression activities that kill, destroy, remove, or manipulate trees, downed woody debris, and other vegetation to achieve desired results, or that cause or prevent fire disturbances that may alter habitat and forest types by either allowing or preventing disturbance-related forest succession.

The alteration, removal, and degradation of this habitat may affect Canada lynx by reducing horizontal vegetation that snowshoe hare rely upon for foraging and sheltering. It may also reduce the amount of denning habitat available to lynx, although denning habitat does not appear to be limited in the action area. In addition, this vegetation may be relied upon by lynx to use for successfully acquiring snowshoe hare prey resources. Ultimately, wildland fire management may reduce an area's ability to provide snowshoe hares for lynx; however, application of the plan components described above may mitigate or avert some potential effects and limit those effects in in space and time. Conversely, the use or management of fire may also regenerate habitat that currently does not provide winter or summer snowshoe hare habitat because of a lack of dense horizontal vegetation. As habitat that has experienced fire goes through successional stages it may provide dense horizontal cover used by snowshoe hare and therefore lynx. Fire may also contribute to creating and maintaining a mosaic of habitat conditions through time at a LAU and landscape scale.

Habitat fragmentation

The 2020 Forest Plan contains several plan components that would maintain, restore, or increase connectivity or reduce fragmentation of lynx habitat:

- FW-WL-DC-03 would establish as a desired condition for vegetation composition and structure to allow wildlife to move within and between NFS parcels in response to seasonal and other habitat needs.
- FW-WL-DC-04 would establish as a desired condition that large, unroaded areas are distributed and connected forestwide.
- DI-WL-DC-01, RM-WL-DC-01, UB-WL-DC-01 (all considered core, occupied areas) would establish desired conditions for these landscapes to provide broad scale habitat connectivity for wide-ranging species; similar desired conditions are also included in the Big Belts and Elkhorns GAs.
- FW-WL-GO-04, and DI-WL-GO-01 would establish goals to identify linkage areas, and acquire ownership or easements of land in certain areas to facilitate wildlife movement among NFS parcels.
- DI-WL-GDL-01 and UB-WL-GDL-01 would constrain vegetation management, motorized travel, and trail construction in areas of concern, for specific areas within occupied potential lynx habitat where there are known concerns about potential habitat fragmentation would help to limit or reverse some causes of fragmentation.

Effects of habitat fragmentation

The proposed action does not directly authorize any activity that would result in a permanent loss or conversion of lynx or snowshoe hare habitat at a scale that approximates the large landscape used by lynx. Some activities allowed under the 2020 Forest Plan could contribute to minor amounts of usually temporary habitat fragmentation through vegetation management and other ground disturbing activities. Any short- or long-term fragmenting effects of these activities would be subject to site-specific analysis and ESA section 7 consultation at the project level when the actual location, habitat, and size of the actions is known.

Generally, management activities allowed under the proposed action may cause temporary losses in minor amounts of lynx and snowshoe hare habitat during vegetation management activities, and other disturbance-related actions by reducing or fragmenting contiguous forested cover that lynx may use as they move throughout the action area. These effects would be limited in time and space, however, since plan components found in the NRLMD and proposed action would be applied during the planning of those actions. Application of the standards and guidelines in the NRLMD in occupied habitat would help to minimize fragmentation related to vegetation management and would promote maintenance or restoration of linkages (i.e. through Objective LINK O1, Standard LINK S1, and Guidelines LINK G1

and G2); those components would be considered in planning and implementation of projects in unoccupied habitat and if applied would minimize potential fragmentation in those areas. Other 2020 Forest Plan components would be applied to any projects planned anywhere on the HLC NF, or in the specified GAs, and would minimize potential fragmentation caused by those management actions. In addition, plan components in the 2020 Forest Plan would provide for habitat connectivity for wide ranging species (EH-WL-DC-02; DI-WL-DC-01; CR-WL-DC-01; BB-WL-DC-03; RM-WL-DC-01; UB-WL-DC-01).

Climate change

This section addresses the manner in which the proposed action would mitigate the effects of climate change or how management would address the changes posed by climate change in order to maintain lynx habitat throughout the life of the revised plan. The anticipated effects of climate change are difficult to predict with enough specificity to address through plan components. Plan components described for vegetation and for vegetation management in the revised plan and in the NRLMD, however, direct managers planning projects to design those projects so that they move vegetation toward desired conditions that approximate the estimated NRV, or at a minimum design projects so that they would not preclude achieving the NRV in the future. The NRV is assumed to approximate the conditions that historically supported lynx. Desired condition FW-WL-DC-03 calls for "vegetation composition, structure, and distribution, as well as forest management, allow wildlife [such as lynx] to move within and between NFS parcels in response to seasonal habitat needs, dispersal needs, disturbances (such as, fire, insect infestations), and long-term changes (such as climate change)". This plan component tells managers to design projects to specifically consider, to the extent possible, future wildlife habitat needs when planning projects and management activities. The proposed action provides guidance to potentially reduce or mitigate the effects of climate change on lynx and their habitats, but the extent to which those components would do so when applied to project planning and implementation is not possible to predict.

Model predictions for combined effects of first-tier influences

In order to better understand the potential combined effects of natural processes (fire, insect infestation, succession) and vegetation management activities (timber harvest, fuels treatment, prescribed fire) that are allowed by and could potentially occur under the revised plan, lynx habitat was modelled using the SIMPPLLE model. The model considers those influences along with predicted general effects of climate change on modelled habitat and structural stages for a period of five decades after implementation of the revised plan (see project file for details on methods, outputs, and metadata).The results are summarized for the entire action area in Figure 6, Figure 7, and Figure 8 below. The figures show an estimated acreage of early stand initiation (Figure 6), stand initiation (Figure 7), and mature, multi-story (Figure 8) in 10-year time steps, along with the estimated current acreage (green dashed line) and estimated NRV (black dashed line). The estimated future acreage is shown in terms of the average (red diamond), interquartile range (gray box) and minimum and maximum (lower and upper whiskers) estimated by the model. The figures show model estimated possible outcomes for alternative A, which represents continuing existing management, and alternative F, which is the preferred alternative.

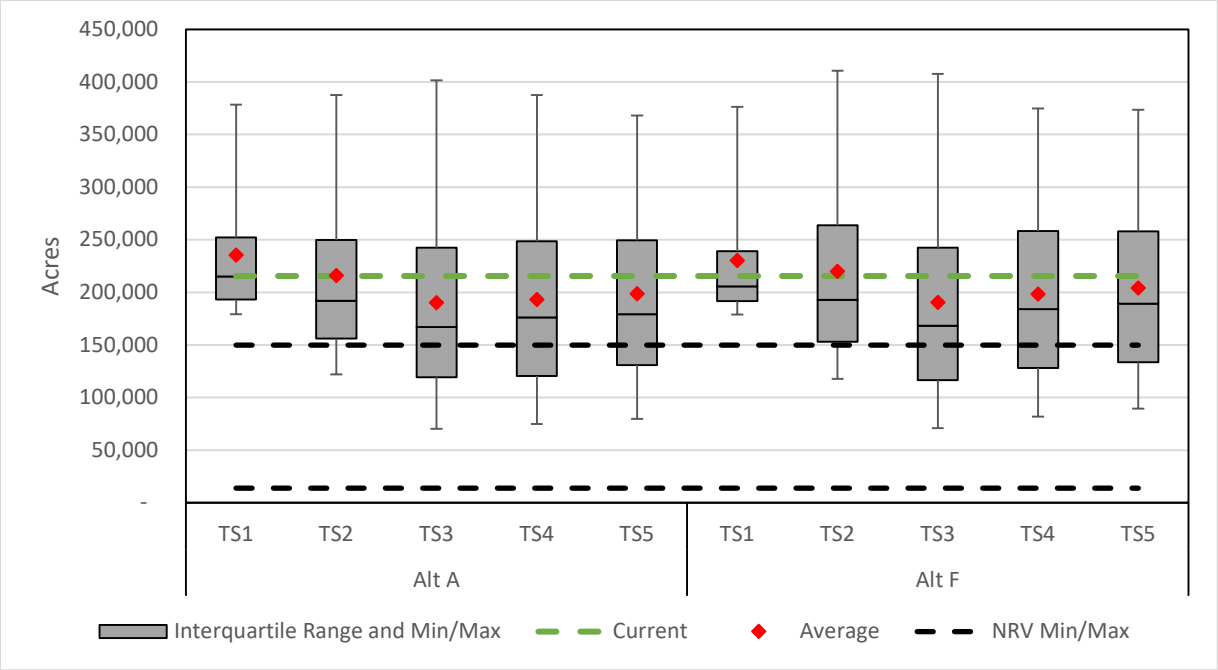

Figure 6. SIMPPLLE model estimated possible acreage of HLC NF potential lynx habitat in early stand initiation (ESI) structural stage for the existing condition/no-action alternative (Alt A) and the proposed action (Alt F) by decade (timestep, or TS)

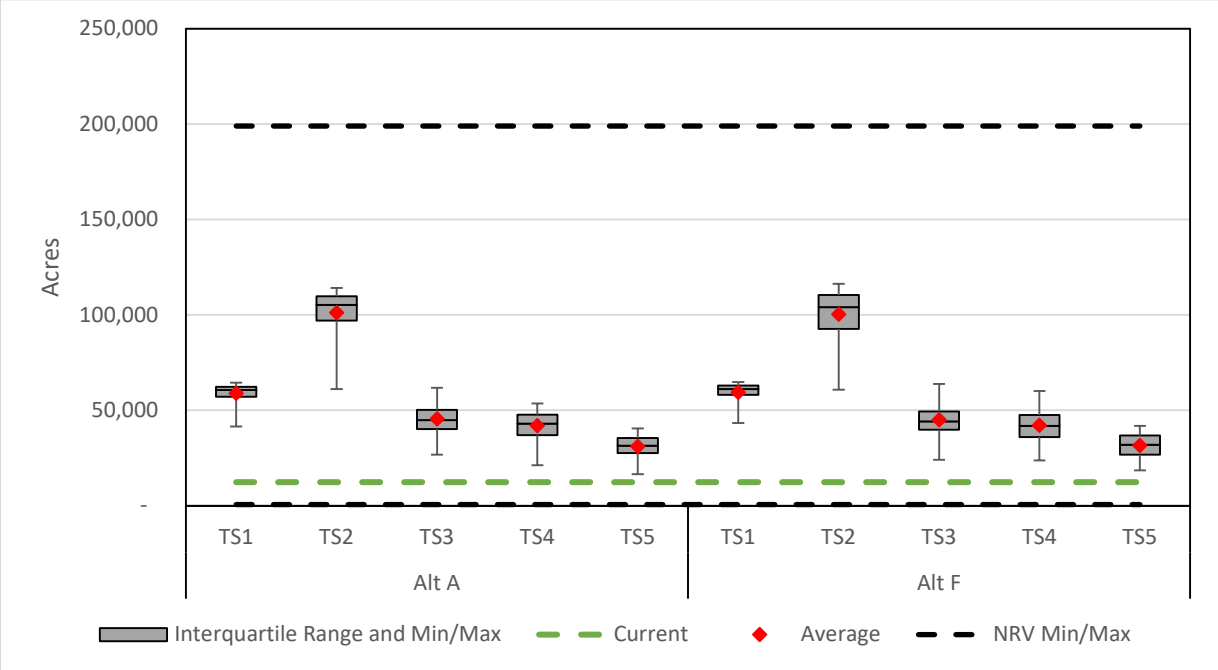

Figure 7. SIMPPLLE model estimated possible acreage of HLC NF potential lynx habitat in stand initiation structural stage for the existing condition/no-action alternative (Alt A) and the proposed action (Alt F) by decade (timestep, TS)

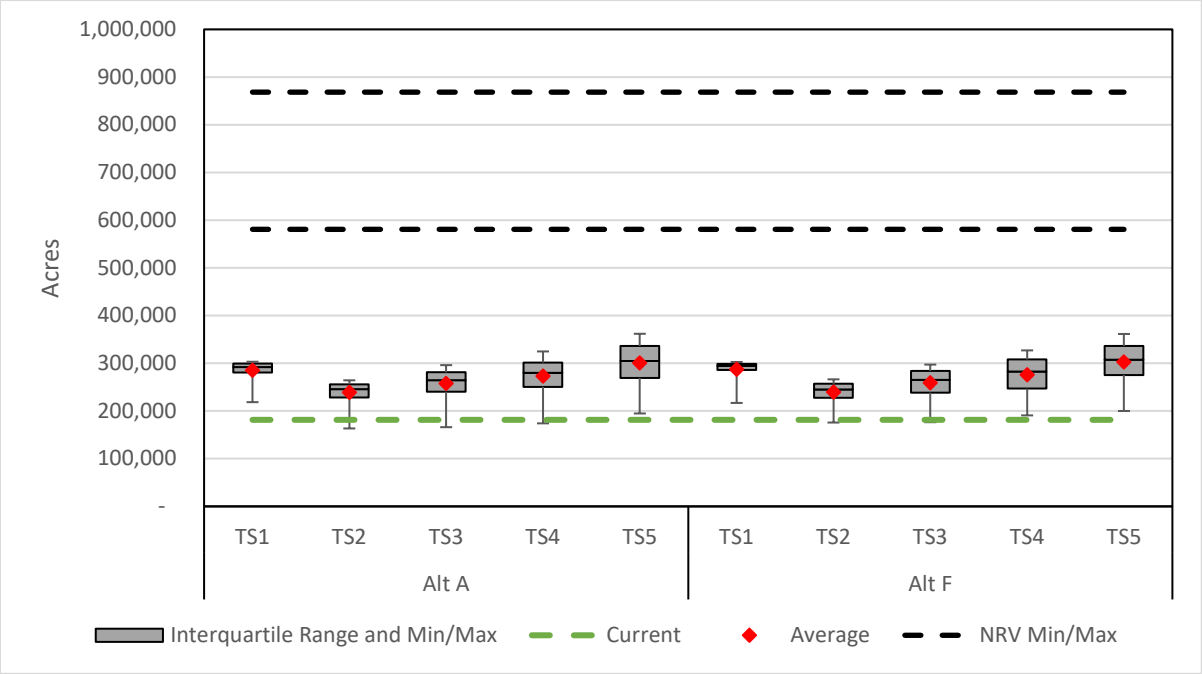

Figure 8. SIMPPLLE model estimated possible acreage of HLC NF potential lynx habitat in mature multi-story structural stage for the existing condition/no-action alternative (Alt A) and the proposed action (Alt F) by decade (timestep, TS)

The model results shown above are estimates designed to provide a general idea of the possible impacts of vegetation and habitat trend over time, relative to the existing condition and to the estimated NRV. Key results are:

- For all modelled structural stages, the differences between alternative A (continuing to implement the 1986 Forest Plans) and alternative F (implementing the proposed action/preferred alternative) are almost nonexistent. This strongly suggests that natural processes are likely to exert far more influence on the structural stage, and therefore availability, of potential lynx foraging habitat at the forestwide scale, than are management-related actions. Model results for individual GAs (see project file) show the same lack of difference between alternatives.
- The early stand initiation stage appears to currently be above the estimated NRV when averaged across the forest and remains so for both modelled alternatives across the entire modelled timeframe. Similarly, the mature multi-storied stage appears to currently be below and remains below the estimated NRV for both alternatives and through the modelled timeframe. Based on assumptions used in the model and based on other vegetation outputs (refer to report in project file and to FEIS), it appears that a warmer, dryer climate combined with anticipated increases in fire across the landscape drive the outcomes for these structural stages.
- Results differ slightly among GAs in the amount of each structural stage over the modelled timeframe compared to current amounts and to the estimated NRV, but for all GAs the predicted results are nearly identical for alternative A and alternative F. That outcome reinforces the conclusion that lynx habitat on the HLC NF is more likely to be influenced now and in the future by natural processes than by differences in management activity.

The results from the SIMPPLLE model are a product of inputs and assumptions and are meant to provide a very general idea of whether management differences between alternatives are likely to influence the amount of available lynx habitat in the future. However, specific management decisions will be made based on a variety of factors that are both site-specific and time-specific.

Second tier anthropogenic influences

The Strategy identifies second tier anthropogenic influences as those expected to have less impact on lynx and lynx habitat than first tier influences or are the responsibility of agencies other than the federal government. They will be briefly discussed.

Domestic livestock grazing

Livestock grazing would continue to be available by permit within the action area (FW-GRAZ-DC-01), at the same or similar levels as currently allowed (see page 69). The 2020 Forest Plan includes components that would be applied when permits and annual operating plans are developed, and that guide the Forest and permittees to provide for the retention of healthy native plant communities (FW-GRAZ-DC-03) and long-term riparian area vegetation (FW-GRAZ-STD-02) within grazing allotments. The objectives and guidelines in the NRLMD regarding livestock grazing would continue to apply to grazing permits and activities in occupied lynx habitat and be considered in unoccupied habitat, as described in the Existing Condition section. When applied to permits and operating plans, these plan components would to reduce competition between cattle and snowshoe hare for certain habitat components (i.e., herbaceous forage and woody browse) where such habitat overlaps and would limit some potential negative effects to lynx habitat of grazing.

Effects to lynx from livestock grazing are anticipated to be insignificant and discountable due to the plan components in place that would limit the potential for competitive interaction, in addition to the unlikelihood that any effects would occur from the continuation of livestock grazing. It is unlikely grazing in the action area would reduce the prey base for an individual lynx.

Minerals and energy development

The 2020 Forest Plan includes desired conditions to continue to supply energy and minerals resources while ensuring the sustainability and resiliency of other resources, including wildlife habitat, are not compromised or degraded (FW-EMIN-DC-05 and DC-06). Guidelines constraining mineral and energy development are intended to minimize potential negative effects largely to aquatic and riparian habitats, which may be important movement corridors for lynx and other wildlife. Plan components in the NRLMD regarding minerals and energy development and other human uses would continue to apply in occupied lynx habitat and be considered in unoccupied habitat, as described in the Existing Condition section. Plan components would be applied when specific minerals and energy development activities, including leasing, exploration, and operations, are planned and the direct and indirect impacts of specific activities, as affected by plan components, would be analyzed at that time and would occur when those activities take place.

Since mineral and energy development could occur within occupied lynx habitat under the revised plan, there is potential for negative effects to lynx and lynx habitat to result from those actions. Such effects could result from changing or eliminating native vegetation used by lynx and snowshoe hare, fragmenting habitat through the development of associated roads, powerlines, and pipelines, and other infrastructure. The amount or degree of impact can vary based on the size, type, and location of such activity. As such, these effects can range from no effect to potentially adverse, depending on the type, location, size, and other aspects of activities associated with a specific mineral or energy development. The degree of potential effect that could result from such developments or explorations is difficult to anticipate or predict at this time largely because specific proposals for minerals or energy development vary widely in their nature, scope, location, and type of proposed activity. Proposals for minerals or energy exploration

or development would adhere to the standards and guidelines for vegetation and for lynx habitat, and impacts would be analyzed for specific proposals when/if they occur.

Recreation

The LCAS notes that if effects to lynx occur from recreation, they are incompletely understood and may depend on the type and context of activity (Interagency Lynx Biology Team, 2013). It further states that the primary impacts to lynx and lynx habitat from recreation are from 1) habitat alternation to maintain health and human safety of recreation sites and areas, which may reduce or degrade lynx and snowshoe hare habitat; 2) displacement of lynx due to summer and winter motorized activity, human presence, and access; and 3) the potential for incidental trapping of lynx resulting from access to preferred habitats via allowable motorized use or development. The following sections discuss briefly the framework programmatic guidance in the 2020 Forest Plan related to those potential impacts.

Recreation opportunities

Recreation is managed by making site-specific decisions about types of opportunity, facilities, access, or permits, all of which are guided by recreation settings that describe types of opportunity and desired recreation experiences. Recreation settings are categorized into six Recreation Opportunity Spectrum (ROS) classes ranging from 'primitive' (e.g., designated wilderness, recommended wilderness areas, and others) to 'rural' (e.g., areas immediately adjacent to small communities or private land inholdings, and others), to 'urban' (refer to Appendix A).

The proposed action identifies areas across the HLC where the various recreation settings would apply, but it does not specifically plan or authorize actions or activities within those settings. The 2020 Forest Plan includes descriptions of desired conditions and identification of activities or uses that would be suitable within specified ROS categories, and that would be consistent with the character of each defined recreation setting. Plan components for recreation opportunities establish desired conditions for providing a range of opportunities while minimizing impacts to at-risk species (FW-REC-DC-04 and DC-07, FW-REC-GDL-01). Management or development of recreation sites or facilities would occur in compliance with recreation settings.

Recreation designated and permitted areas and uses

The proposed action designates or identifies specific areas in which management would emphasize recreation values, such as the South Hills and the Grandview Recreation Areas, and others (refer to 2020 Forest Plan components found in Appendix A).

The proposed action includes two recreation emphasis areas: the Grandview Recreation Area in the Snowies GA, and the South Hills Recreation Area in the Divide GA. The Grandview Recreation Area (32,296 acres) would be in secondary unoccupied habitat where lynx may be present. The South Hills Recreation Area (50,181 acres total area) would include 17,880 acres of potential lynx habitat, some of which is core and designated critical habitat and some of which is secondary unoccupied. Plan components for management of each area would limit some uses that could negatively impact lynx. Both areas would emphasize non-motorized recreation (DI-SHRA-DC-01 and SN-GVRA-DC-03); mechanized transport (i.e. mountain bikes) would be limited to established roads and trails (DI-SHRA-SUIT-02 and SN-GVRA-SUIT-02), thereby potentially limiting displacement to lynx resulting from motorized and mechanized travel.

Timber production would not be allowed in either area, although harvest could be used for resource management purposes (DI-SHRA-SUIT-01 and SN-GVRA-SUIT-01). When vegetation management is planned in the South Hills Recreation Area, plan components would guide the Forest to meet vegetation desired conditions, emphasize safety and recreation experiences, and reduce the risk of high-severity wildfire (DI-SHRA-GDL-01). The standards and guidelines in the NRLMD would apply to any vegetation management planning in the South Hills Recreation Area. The area includes approximately

17,240 acres of potential lynx habitat that is also in the WUI, where exemptions to the NRLMD vegetation standards could be applied when planning and implementing fuels treatments. The combination of WUI and emphasis on safety and on reduction of wildfire risk could result in some negative impacts to lynx habitat in the South Hills Recreation Area from vegetation management (see vegetation management above for discussion of such effects). These impacts would be analyzed and consulted on when specific vegetation management projects are planned and would only occur upon implementation of those projects. The NRLMD standards and guidelines would be considered when planning management actions in the Grandview Recreation Area.

The 2020 Forest Plan identifies two existing alpine ski areas: Teton Pass Ski Area on the Rocky Mountain Range GA (currently occupied, designated critical habitat), and Showdown Ski Area (currently unoccupied, secondary area) on the Little Belts GA. The 2020 Forest Plan includes desired conditions that identify the general opportunities that would be provided by each ski area (LB-SHOWSKI-DC-01 and RM-TETONSKI-DC-01) and that emphasize safety, user experience, and protection of infrastructure when vegetation management is planned (LB-SHOWSKI-DC-02 and RM-TETONSKI-DC-02). Forestwide and GA specific plan components, including those in the NRLMD and others related to lynx and lynx habitat, would apply to management of activities and uses occurring in or associated with the identified ski areas. The NRLMD allows for exceptions to VEG S6 for ski area infrastructure, i.e., lift towers, buildings (not the ski runs themselves). Any use of those exceptions would be analyzed and consulted on when relevant projects are planned. In general, the presence of ski areas has potential impacts to lynx through displacement, habitat loss, and snow compaction that could facilitate interspecific competition for prey. The effects of operation of Teton Pass Ski Area were analyzed and received section 7 consultation in 2001 after lynx were listed under the ESA. In its BO, the Service noted that "the primary effects to lynx of ski resorts in Montana is the permanent or long-term loss of local lynx habitat". The BO notes, however, that the permitted acreage of ski resorts "comprises a small proportion of the lynx habitat on federal lands in Montana", that not all acreage within the permitted areas would become unsuitable, and ski resort expansion is expected to increase only a small amount over the baseline analyzed at that time. The Service determined that operation of ski areas would not jeopardize or otherwise impact the lynx population (U.S. Department of the Interior, Fish and Wildlife Service, 2001). A proposed expansion of the Teton Pass Ski Area was analyzed and consulted on in 2010; in its BA, the FS determined that implementation of the expansion would not likely adversely affect lynx because of the negligible amount of lynx foraging, denning and travel habitat that would be impacted through clearing of vegetation and new areas of snow compaction (U. S. Department of Agriculture, 2010). The Service concurred and stated the ski area expansion was "not expected to significantly reduce habitat effectiveness for lynx", and that impacts to lynx and lynx designated critical habitat would be insignificant (U. S. Department of the Interior, 2010). Delineation of permit areas, identification of uses and activities allowed in each area, and identification of future infrastructure or other changes would continue to occur when permits and operating plans are developed. Potential impacts of activities and management actions would be analyzed and consulted on at that time.

Other allowable recreational uses

Hunting and trapping occur on NFS lands (FW-FWL-DC-02 and DC-04) but are managed by state law under the jurisdiction of Montana Fish, Wildlife, and Parks (MFWP). Incidental trapping of lynx may occur as a consequence of trapping for other species, but trapping practices and quotas are established and enforced by MFWP. Activities that are managed by the FS on NFS lands and that are associated with hunting and trapping include motorized and non-motorized access, developed and dispersed camping, and outfitter and guide permits and operations. Motorized access, as described elsewhere in this assessment, is managed according to travel plans. Forest plan components that guide travel management are applied when travel plans are updated, and effects to lynx and their habitats are considered and consulted on at that time. Similarly, components that guide management of recreation facilities, sites, and permits are applied when those activities are planned or updated, and effects are analyzed at that time.

There are approximately 2,600 miles of existing motorized and nonmotorized roads and trails in the action area that are used for a variety of purposes; one of their primary roles is to provide recreation access on NFS lands. Plan components (FW-RT-DC-01; DC-04; GDL-12) provide for maintaining habitat and limiting transportation system impacts to threatened and endangered species. The 2020 Forest Plan establishes a goal (FW-RT-GO-03) to facilitate cooperation between the Forest and highway and landowners to implement wildlife crossings that contribute to wildlife and public safety where needed. The presence of a motorized transportation system may impact lynx and lynx habitat by 1) direct habitat loss from the road prism; 2) potential for collisions between vehicles and lynx; 3) reductions in potential available denning habitat if accessible roads, denning habitat, and breeding lynx occur in close spatial proximity; 4) providing human access to preferred lynx habitat where incidental non-target trapping may occur during legal trapping activities; and 5) snow compaction from winter motorized recreation.

The effects to lynx from a transportation system, for recreational or other purposes, as allowable in the revised plan, will be insignificant and discountable to lynx because 1) direct habitat loss would be averted in occupied lynx habitat due to the presence of plan components and provisions in the NRLMD; 2) the potential for collisions between vehicles and lynx is extremely low (Interagency Lynx Biology Team, 2013), therefore, it is discountable; 3) losses to denning habitat that could occur ancillary to the transportation system (such as access to harvestable timber ground where timber management activities degrade or remove denning habitat) will not reduce the overall availability of denning habitat across the action area for use by breeding lynx due to the preponderance of occupied lynx habitat occurring in areas with designations that preclude vegetation management; 4) the likelihood forest access roads would result in nontarget incidental lynx trapping is extremely unlikely, therefore, it is discountable; and 5) any potential effects to lynx from winter motorized recreation that compacts snow are anticipated to be insignificant and discountable, based upon findings by Squires and others (Squires et al., 2010; Squires et al., 2013) and Kolbe and others (2007). Recent work from Squires and others (Squires, Olson, Roberts, Ivan, & Hebblewhite, 2019) further describes winter recreation's potentially limited degree of effect on lynx, depending on the spatial juxtaposition of occupied lynx habitat and winter recreation in that habitat.

The impacts of maintaining or building specific motorized routes will be analyzed during planning for those projects. Management of the motorized transportation system is guided by travel management plans, which are analyzed and undergo appropriate consultation when they are updated or revised.

Cumulative effects

Cumulative effects include state, tribal, local, or private actions that are reasonably certain to occur in the action area. Federal lands other than those administered by the Forest are not included because those areas are subject to their own section 7 consultation requirements.

For context, Table 25 displays the acreage of potential lynx habitat within the external administrative boundary of the HLC NF (the action area) but that is under non-federal ownership. Habitat is displayed by structural stage, using the same mapping effort used to display the information regarding lynx habitat on NFS lands in the action area shown in Table 15. The amount and condition of potential lynx habitat on non-federal land outside but adjacent to the action area is not known, but is likely minimal because those areas are largely low elevation lands, much of which is non-forested or does not contain boreal forest that might provide habitat.

Table 25. Potential lynx habitat in the action area under nonfederal ownership, by structural stage

Ownership	Acres	Acres LAU	Acres potential lynx habitat	Percent of total potential lynx habitat	Stand initiation[24] acres (%)	Early stand initiation[25] acres (%)	Multistory[26] acres (%)	Other[27] acres (%)
State	13,800	12,248	5,066	<1%	66 (1)	530 (10)	1,541 (30)	2,908 (57)
Private	310,727	153,118	57,285	4%	1,117 (2)	4,120 (7)	21,928 (38)	29,669 (52)
County	53	28	18	<1%	0 (0)	5 (28)	9 (50)	4 (22)
City	734	734	415	<1%	6 (1)	3 (<1)	46 (11)	360 (87)
TOTAL	325,314	166,128	62,784	4%	1,189 (2)	4,658 (7)	23,524 (37)	32,941 (52)

Vegetation management and wildland fire management actions on private lands in the action area may occur throughout the life of the plan. While the quality of lynx habitat in these areas is not known, some portion of these areas may be used by lynx or incorporated into home ranges of individual lynx. Where quality lynx habitat on NFS lands and private lands is contiguous, management of vegetation and of wildland fire on private lands could add to the effects of project-level vegetation management on NFS lands, if management activities occur in close spatial and temporal proximity. Non-federal lands within LAUs totals less than 2% of the overall action area, so the effects to lynx of actions on those lands is likely to be minimal. Nevertheless, vegetation and wildland fire management activities on private lands within the action area have the potential to be cumulatively adverse to individual lynx when added to management activities with similar effects occurring on adjacent NFS lands.

Nature-based recreation (i.e. recreation occurring in or associated with natural settings) has been increasing and is likely to continue to do so (U.S. Department of Agriculture, Forest Service, 2016). There may be needs or desires to increase recreation developments or facilities on NFS lands to accommodate more forest visitors (ibid). Recreation occurring on private or other lands adjacent to NFS lands where lynx habitat occurs may spill over onto NFS lands as the overall number of recreationists increases. Increases in human disturbance occurring within lynx habitat on NFS lands could cause portions of NFS lands with less human disturbance to become more important for lynx.

The state of Montana allows hunting and trapping of a variety of big game and furbearing species in the action area. While it is not legal to hunt or trap Canada lynx, the incidental trapping or harvest of lynx may occur in the process of trapping or harvesting legal target species.

Determination of effects

Implementation of the proposed federal action *May Affect and is Likely to Adversely Affect* Canada lynx on the Helena-Lewis and Clark National Forest.

[24] Stand initiation structural stage that may provide year-round snowshoe hare habitat because the trees have grown tall enough to protrude above the snow in winter depending on site-specific stand conditions and horizontal structure.
[25] Stand initiation structural stage where the trees have not grown tall enough to protrude above the snow in winter but can provide snowshoe hare habitat during the non-winter months and is typically moving toward year-round snowshoe hare habitat.
[26] Multistory structural stage with many age classes and vegetation layers that may provide year-round snowshoe hare habitat via dense horizontal cover depending on site-specific stand conditions and horizontal structure.
[27] Any stand that does not fall into one of the above categories, to include Other, NFV and SE. Stands in this column may or may not provide foraging habitat for lynx and require ground validation at the project planning scale.

Rationale for determination

This biological assessment analyzes the potential impacts to Canada lynx of implementing the framework programmatic Helena-Lewis and Clark National Forest revised land and resource management plan. Impacts to lynx and their habitat have been considered in the context of the estimated natural range of variation in vegetation conditions, potential climate change, the anticipated amount and distribution of vegetation manipulation, and guidance in the 2020 Forest Plan regarding management of vegetation, wildland fire, and human uses.

The proposed programmatic action identifies allowable uses on NFS lands and establishes the area or spatial extent over which some of those uses could be planned or occur. Allowable uses include timber harvest, pre-commercial thinning, fuels reduction, and other vegetation management actions that could have adverse impacts to lynx by removing, altering, or diminishing snowshoe hare habitat. The proposed action does not determine the amount, location, type, or scope of those future actions, but rather it establishes the desired conditions to be achieved and establishes constraints on future actions when they are planned and implemented. Therefore, the framework programmatic action would not result in direct or indirect effects to Canada lynx or their habitat. The location, type, and scope of future actions would be established at the time of project planning, which will determine the actual presence and amount of potential effect. Appropriate analysis and consultation will occur as specific projects are planned.

The proposed action includes objectives to treat a minimum acreage of fuels within the Wildland-Urban Interface, and to treat mature multi-story forest and use pre-commercial thinning to achieve specific resource benefits, using exemptions and exceptions to NRLMD vegetation standards. A portion of this acreage is predicted to occur in habitat that is currently considered occupied, where lynx are presumed to be resident, and habitat currently considered unoccupied lynx habitat, where lynx may be present. These treatments are expected to have limited and localized adverse effects to lynx in occupied areas by making treated habitat temporarily unsuitable for foraging by lynx. In unoccupied areas where lynx may be present but are not currently known to be resident, these effects are anticipated to be insignificant. Adverse effects to lynx in occupied areas resulting from vegetation management on lands administered by the HLC NF could be cumulative to effects of timber harvest, fuels treatment, or other habitat alterations occurring on adjoining, non-NFS lands.

Other allowable uses that would be guided by the framework programmatic action include livestock grazing, energy and minerals development, recreation, and maintenance and use of the Forest transportation system. Management decisions regarding the amount, location, extent, and type of these actions would occur on a project basis, including updates to travel plans, permits, and operating plans; those decisions would be guided and/or constrained by the 2020 Forest Plan. The forest anticipates potential effects of these other uses as being mostly insignificant and discountable. These effects include the potential for competition between livestock and snowshoe hare for herbaceous vegetation; the potential for habitat removal, alteration, and fragmentation from mineral and energy exploration and development; and the potential for habitat removal, alteration, fragmentation, incidental trapping or other mortality, and snow compaction that may all result from recreation activities and forest access roads.

All activities and uses would, when planned and implemented, be subject to plan components (see Appendix A) that establish desired conditions to maintain or restore lynx habitat, and that are designed to avoid or minimize adverse effects to individual lynx and the habitat they occupy on lands administered by the HLC NF.

Canada lynx designated critical habitat

Consultation history

The Helena National Forest Plan and the Lewis and Clark National Forest Plan were both signed in 1986 after receiving BOs on species listed in both action areas. The USFWS determined that both plans would not likely jeopardize the continued existence of threatened or endangered species. At the time, there was no critical habitat designated for Canada lynx. The USFWS issued a BO on the NRMLD amendment of 18 National Forest land and resource management plans on March 2007.

In September of 2014, the USFWS published a final rule (79 CFR 54782) that again revised the previous (2009) designation of critical habitat and the distinct population boundary for the contiguous United States distinct population segment of Canada lynx (U.S. Department of the Interior, Fish and Wildlife Service, 2014c): the 2014 revised rule includes all or portions of ten National Forests that appended the NRLMD to their land management plans in 2007.

In 2017, the FS consulted on potential impacts to designated Canada lynx critical habitat of implementing the NRLMD. The October 2017 BO (U.S. Department of the Interior, Fish and Wildlife Service, 2017b) concluded that ongoing implementation of the NRLMD was not likely to result in the destruction or adverse modification of Canada lynx designated critical habitat.

Under the ESA, specific areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features that: (1) are essential to the conservation of the species; and (2) may require special management considerations or protection. Areas outside the geographical area occupied by the species at the time it is listed could also be designated as critical habitat if a designation limited to its current range would be inadequate to ensure the conservation of the species (ibid).

In its designation of critical habitat, the USFWS stated, “we consider lynx habitat to include forested areas with the potential, through natural succession, to produce high-quality snowshoe hare habitat, regardless of their current stage of forest succession” (ibid). The Service’s definition of lynx habitat is consistent with mapping direction provided in Appendix B of the NRLMD. The Service also stated:

> *when determining critical habitat boundaries, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands lack physical or biological features necessary for lynx. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed lands. Given the scale of the lynx critical habitat units, it was not feasible to completely avoid inclusion of water bodies, including lakes, reservoirs, and rivers; grasslands; or human-made structures such as buildings, paved and gravel roadbeds, parking lots, and other structures that lack the PCE for the lynx. These areas, including any developed areas and the land on which such structures are located, that exist inside critical habitat boundaries are not intended to be designated as critical habitat. Any such lands inadvertently left inside critical habitat boundaries shown on the maps of this final rule have been excluded by text in this rule. Therefore, a Federal action involving these lands would not trigger section 7 consultation with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the physical or biological features in the adjacent critical habitat. (ibid)*

On October 2017, the USFWS issued a BO on the effects of the NRLMD on Canada lynx designated critical habitat, covering several National Forests including the now-combined Helena-Lewis and Clark NF (action area) as described in this assessment.

Existing condition

The action area is the portion of critical habitat unit 3 (Figure 9) that occurs on lands administered by the HLC NF. Critical habitat unit 3 consists of about 9,783 mi^2 in the northern Rocky Mountains and coincides with lynx core areas in northwestern Montana and northeastern Idaho. According to the USFWS, this area appears to support the highest density of lynx populations in the northern Rockies. This area contains the physical and biological elements essential to the conservation of lynx, known as the primary constituent element (PCE) and its components.

The USFWS determined that the primary constituent element for lynx critical habitat is:

1. Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing:
    a) Presence of snowshoe hares and their preferred habitat conditions, which include dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface;
    b) Winter snow conditions that are generally deep and fluffy for extended periods of time;
    c) Sites for denning that have abundant coarse woody debris, such as downed trees and root wads; and
    d) Matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range.

In addition, the Service describes actions that have the potential to adversely modify critical habitat. As stated in the USFWS's final rule, there are three primary actions that have the potential to adversely modify critical habitat:

1. Actions that would reduce or remove understory vegetation within boreal forest stands on a scale proportionate to the large landscape used by lynx. These activities could significantly reduce the quality of snowshoe hare habitat such that the landscape's ability to produce adequate densities of snowshoe hares to support persistent lynx populations is at least temporarily diminished.
2. Actions that would cause permanent loss or conversion of the boreal forest on a scale proportionate to the large landscape used by lynx. Such activities could eliminate and fragment lynx and snowshoe hare habitat.
3. Actions that would increase traffic volume and speed on roads that divide lynx critical habitat. These activities could reduce connectivity within the boreal landscape for lynx and could result in increased mortality of lynx.

Designated critical habitat in the action area

The action area for Canada lynx designated critical habitat in this biological assessment is the Geographic Areas (GAs) that occur within the portion of critical habitat unit 3 occurring on the HLC NF, i.e., the Rocky Mountain Range GA, the Upper Blackfoot GA, and the portion of the Divide GA north of Highway 12 (Figure 9). This area is approximately 1,830 mi^2 (approximately 1,099,991 acres) of NFS lands.

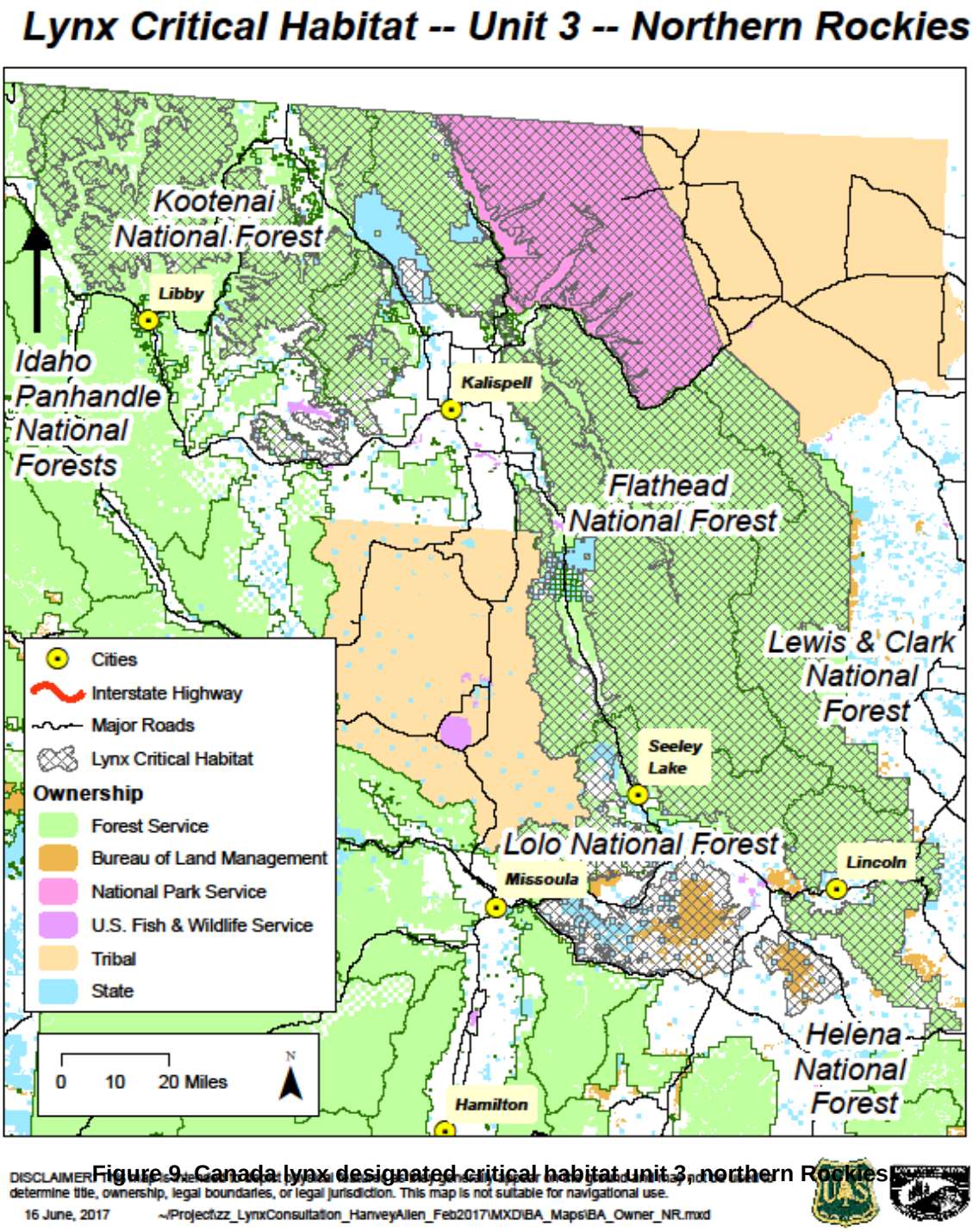

Figure 9. Canada lynx designated critical habitat unit 3, northern Rockies

The area described above includes roughly 715,695 acres of potential lynx habitat (Table 26); refer to the Canada lynx assessment and to the project file for information regarding lynx habitat mapping on the HLC NF.

Table 26. Acres of critical habitat by primary constituent element in the action area

Forest	Acres designated critical habitat	Acres LAU	Acres potential lynx habitat	Acres PCE 1a[28]	Acres PCE 1c[29]	Acres PCE 1d[30]
Helena	403,838	403,838	278,681	101,856	138,980	126,475
Lewis and Clark	696,153	694,963	437,014	117,898	159,812	268,747
Total	1,099,991	1,098,801	715,695	219,754	298,792	395,222

Of the over 1 million acres of critical habitat in the action area, approximately 44 percent of that habitat is presently available for timber harvest and 7 percent for timber production (Table 27). Winter motorized use is presently allowable on 21 percent of critical habitat, and summer motorized use allowable on 14 percent.

Table 27. Allowable uses and critical habitat in the action area, existing condition and proposed action

Allowable uses	Acres total revised plan area	Acres critical habitat existing condition	Percent of critical habitat existing condition	Acres critical habitat proposed action	Percent of critical habitat proposed action
Timber harvest	1,654,916	481,464	44%	463,051	42%
Timber production	414,936	74,086	7%	61,024	6%
Livestock grazing	1,355,143	270,305	25%	270,305	25%
Wheeled motorized	1,099,010	153,801	14%	155,354	14%
Over-the-snow motor vehicle	1,043,323	235,739	21%	220,960	20%

Federal actions that have occurred on the Forest within critical habitat have been subject to the provisions of the NRLMD and section 7 of the Endangered Species Act. The HLC NF has used exemptions and exceptions to vegetation standards allowed by the NRLMD to undertake actions that can alter or remove lynx and snowshoe hare habitat. Table 28 shows the acres of exemptions and exceptions used by the Forest from 2007-2019; Table 28 corresponds to Figure 10 and Figure 11, which display the spatial arrangements of those treatments in the action area. The table and figures include only those projects for which section 7 consultation has been completed, and a decision has been signed by the responsible official and remains in effect.

[28] PCE 1a is assumed to be potential lynx habitat in stand initiation and/or multi-story structural stage.
[29] PCE 1c is assumed to be potential lynx habitat in a multi-story and/or other structural stage; although it may also be present in early stand initiation and stand initiation structural stages, but those are not included here for calculations.
[30] PCE 1d is assumed to be other habitat in the respective LAU not mapped as lynx habitat due to high elevation non-forested habitats, dry forest habitat types, rock outcrops, sites dominated by dry grass/forbs/shrubs, low elevations, and large water bodies if present.

Table 28. Critical habitat treated in the action area 2007-2019

National Forest[1]	Acres Critical Habitat Treated 2007- 2019		
	Total critical habitat treated	In WUI where the 6% exemption applies	Where veg S5 applies
Helena	750	0	0
Lewis and Clark	4,822	585	0
TOTAL	5,572	585	0

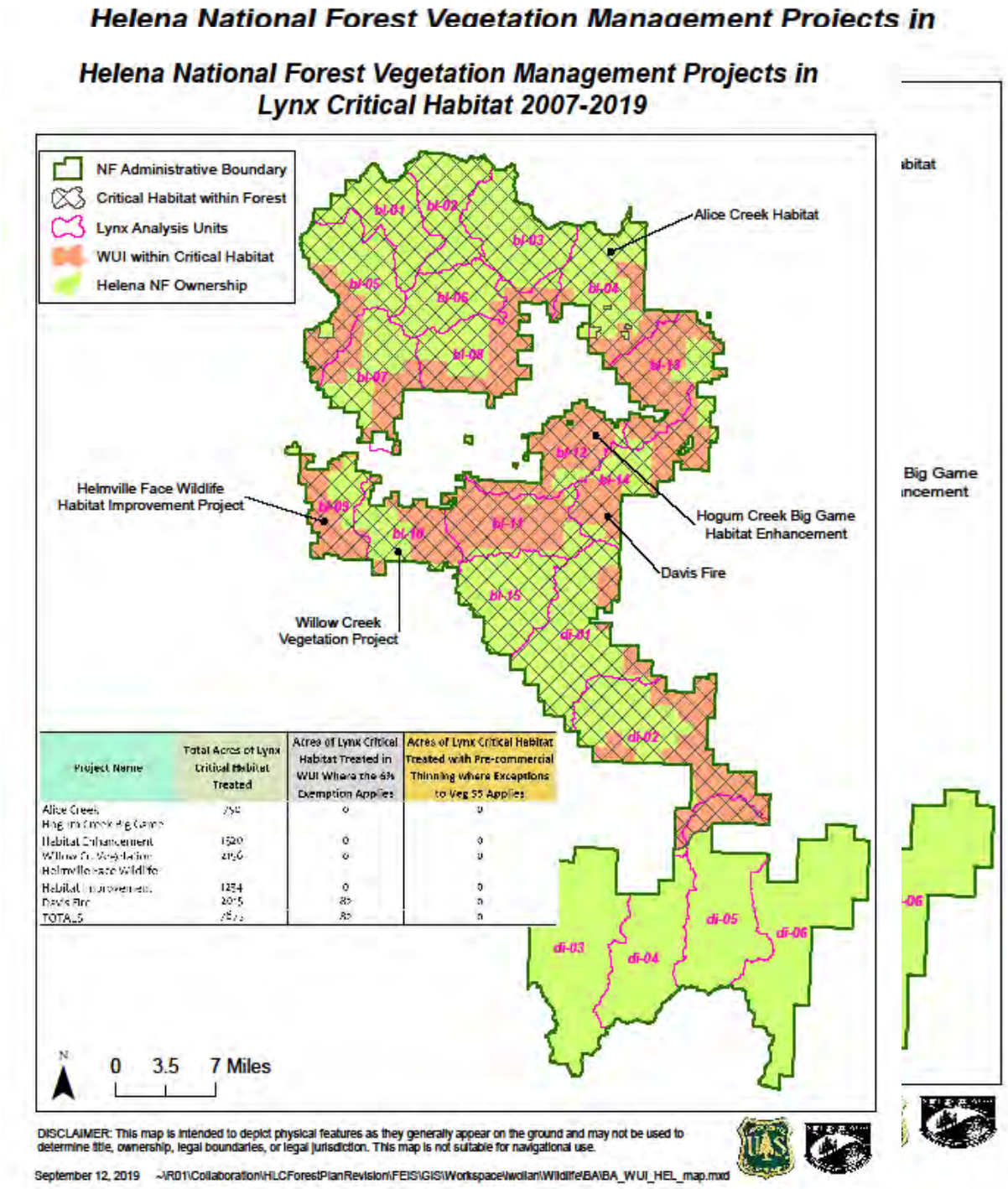

Figure 10. Helena National Forest vegetation management projects in lynx critical habitat 2007-2019 where NRLMD exemptions and exceptions were applied

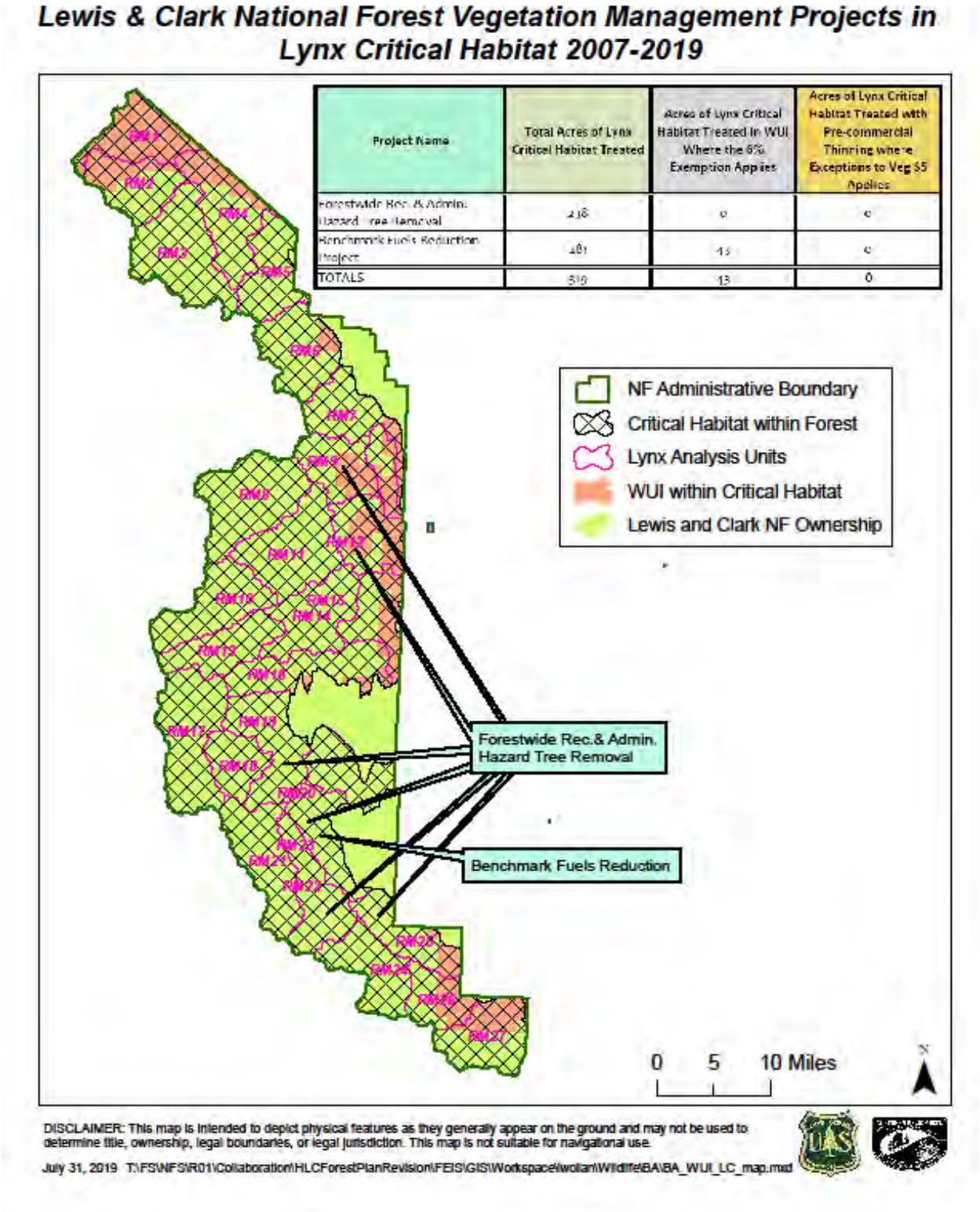

Figure 11. Lewis and Clark National Forest vegetation management projects in lynx critical habitat 2007-2019 where NRLMD exemptions and exceptions were applied

Designated areas

Under the current Helena National Forest and Lewis and Clark National Forest land and resource management plans, approximately 47 percent of the action area is under a particular designation that restricts of prohibits management activities such as timber production, harvest, motorized uses, and others that may impact the PCE. Of the total National Forest acres in the action area, 47 percent occur in designated wilderness, 42 percent in Inventoried Roadless Areas, 5 percent in areas identified as recommended wilderness in the existing (1986) Helena NF and Lewis and Clark NF plans, and other small amounts in research natural areas (Table 29).

Table 29. Designated areas in the Canada lynx designated critical habitat action area, existing condition

Designated area	Acres critical habitat	Percent
Congressionally Designated		
Wilderness areas	520,911	47%
Wilderness study areas	0	0%
Inventoried roadless areas	463,101	42%
Conservation management area	129,598	12%
Administratively designated in preferred alternative		
Recommended wilderness areas	0	0%
Research natural areas	3,283	<1%

Vegetation management

Under the 1986 Forest Plans, approximately 44 percent of the critical habitat action area is available to timber harvest, and 7 percent for timber production (Table 27). Other vegetation management actions that are presently allowed include but are not limited to precommercial thinning, use of prescribed fire for vegetation management, and other mechanical and nonmechanical methods that otherwise kill, remove, destroy, harvest, burn, and masticate vegetation. Of those treatment types, Table 30 describes the amount of critical habitat affected by regeneration harvest from 1987-2019.

Table 30. Geographic areas in the Canada lynx designate critical habitat action area and critical habitat affected by regeneration harvest and wildland fire from 1987 to present

Geographic area	Acres critical habitat	Acres (%) critical habitat affected by regeneration harvest 1987-2019	Acres (%) critical habitat affected[31] by wildland fire 1987-2018
Rocky Mountain Range	696,152	1,115 (<1%)	315,576 (45%)
Upper Blackfoot	332,360	8,984 (3%)	108,673 (33%)
Divide	71,478	2,888 (4%)	2 (<1%)
Total	1,099,991	12,987 (1%)	424,251 (39%)

Wildland fire management

Wildland fire management in the critical habitat action area is described above in the Canada lynx biological assessment and applies here. The exception here being the action area as only areas designated as critical habitat. In the action area, approximately 424,251 acres of National Forest lands have been impacted by wildfire from 1987-2019, many of these fires predating the designation of critical habitat (Table 30). A majority of wildland fire has occurred on the Rocky Mountain Range GA, with remaining portions mostly on the Upper Blackfoot GA (Table 30).

[31] Habitat affected by fire may be in a variety of structural stages, depending on the intensity and severity of the fire

Other allowable uses

Other allowable or prohibited uses and activities such as recreation, livestock grazing, and minerals and energy development will be included here. These activities represent program areas that can have effects to critical habitat, but they are mostly insignificant and discountable and not likely to be adverse.

Recreation

Presently, summer motorized recreation is allowable on approximately 153,801 acres (14%) of critical habitat, and winter over-the-snow recreation on 235,739 acres (21%). Nonmotorized summer recreation is allowable on 946,190 acres (86%) of critical habitat, and winter nonmotorized on 864,251 acres (79%). With these motorized and nonmotorized recreation opportunities, there is potential for impacts to the PCE and its components through 1) managing vegetation for roads and trail systems, user safety, and developed area maintenance that can impact PCE 1 a, c, and d; 2) direct loss of PCE 1 a, c, and d through road and trail construction and area developments; 3) impacts to PCE 1 b through snow compaction during winter motorized and nonmotorized recreation both on and off trail.

Livestock grazing

Under the 1986 Forest Plans, livestock grazing is allowable on approximately 270,305 acres (25%) of critical habitat in the Rocky Mountain Range, Upper Blackfoot, and Divide GA's. For types of livestock and animal unit months/ head, see livestock grazing in the lynx assessment (page 69). Livestock grazing has the potential for competitive interactions to occur between livestock and snowshoe hare for herbaceous vegetation (PCE 1a).

Minerals and energy development

Mineral and energy resources are potentially available for use in the action area, following appropriate administration and in accordance with state and federal law. These types activities may vary widely depending on the type of mineral or energy and system of use or extraction, from recreational panning to subsurface mining and oil and gas leasing. Mineral and energy development may or may not require the use of roads, ground-disturbing activities, mechanical equipment, activities in riparian areas or on more remote mountain tops or hillsides, hand tools, blasting, and drilling, among others. Much of the action area has no-surface occupancy restrictions for such resources due to wilderness and conservation management designations. Potential effects to critical habitat that may result from mineral and energy development vary widely and cannot be predicted without sufficient descriptions of actions, notices of intent, and area-specific resource and habitat conditions.

Environmental consequences

Future federal activities carried out under the proposed action within Canada lynx designated critical habitat will be analyzed under the section 7 consultation process for potential effects to the PCE of Canada lynx designated critical habitat. In its final rule designating critical habitat, the Service identified the following federal actions that would potentially adversely modify critical habitat:

1. Actions that would reduce or remove understory vegetation within boreal forest stands on a scale proportionate to the large landscape used by lynx. These activities could significantly reduce the quality of snowshoe hare habitat such that the landscape's ability to produce adequate densities of snowshoe hares to support persistent lynx populations is at least temporarily diminished.
2. Actions that would cause permanent loss or conversion of the boreal forest on a scale proportionate to the large landscape used by lynx. Such activities could eliminate and fragment lynx and snowshoe hare habitat.
3. Actions that would increase traffic volume and speed on roads that divide lynx critical habitat. These activities could reduce connectivity within the boreal landscape for lynx and could result in increased mortality of lynx.

This biological assessment will analyze broad potential effects to critical habitat from activities that would be allowed or prohibited in the 2020 Forest Plan based on the above factors. The proposed federal action is a framework programmatic plan that does not authorize site-specific actions, or make decisions approving or prohibiting those specific actions or activities, rather, it guides subsequent site-specific planning and decision-making. Actions carried out under the revised plan would be subject to their own section 7 consultation requirements.

Summary of plan content

Table 31 summarizes how NRLMD objectives, guidelines, standards, and plan components described in the 2020 Forest Plan would contribute to conservation of critical habitat when applied to projects and management actions.

Table 31. Canada lynx designated critical habitat primary constituent element, NRLMD, and HLCNF 2020 Forest Plan components that provide for the conservation of critical habitat

Primary constituent element	Description	Associated NRLMD objectives, guidelines, standards / 2020 Forest Plan components
1.	Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing:	VEG O1, VEG O2, VEG O3, VEG O4. / FW-WL-DC-09, FW-VEGT-DC-01, FW-VEGT-DC-02, DI-WL-DC-01, DI-VEGF-DC-04, RM-VEGF-DC-04, RM-WL-DC-01, UB-VEGF-DC-04, UB-WL-DC-01
a.	Presence of snowshoe hares and their preferred habitat conditions, including dense understories of young trees, shrubs, or overhanging boughs that protrude above the snow and mature multistoried stands with conifer boughs touching the snow surface;	VEG O1, VEG O2, VEG O3, VEG O4; VEG S1, VEG S2, VEG S5 and VEG S6; VEG G1, VEG G4, VEG G5 and VEG G10; GRAZ G1, GRAZ G2, GRAZ G3, and GRAZ G4; HU G1, HU G2, HU G8 (and VEG G10 in WUI) / FW-WL-DC-09, FW-VEGT-DC-01, FW-VEGT-DC-02 DI-VEGF-DC-04, DI-WL-DC-01, RM-VEGF-DC-04, RM-WL-DC-01, UB-VEGF-DC-04, UB-WL-DC-01
b.	Winter snow conditions that are generally deep and fluffy for extended periods of time;	VEG G4; HU G4, HU G11, HU G12 / FW-WILD-SUIT-02, FW-RECWILD-SUIT-06.
c.	Sites for denning that have abundant coarse woody debris (downed trees and root wads);	VEG O1; VEG G11; HU G1 / FW-WL-DC-09, FW-VEGT-DC-01, FW-VEGT-DC-02 DI-WL-DC-01, DI-VEGF-DC-04, RM-VEGF-DC-04, RM-WL-DC-01, UB-VEGF-DC-04, UB-WL-DC-01
d.	Matrix habitat (e.g., hardwood forest, dry forest, non-forest, or habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range.	ALL 01, ALL S1, ALL G1; GRAZ G4; HU G3 and HU G7; LINK 01, LINK S1 and LINK G1 / FW-WL-DC-09, FW-VEGT-DC-01, FW-VEGT-DC-02, FW-VEGT-DC-03, FW-RT-GO-03, FW-RT-DC-04, FW-WSR-GDL-01, DI-WL-DC-01, DI-VEGF-DC-04, RM-VEGF-DC-04, RM-WL-DC-01, UB-VEGF-DC-04, UB-WL-DC-01

Effects of the proposed action on factors affecting lynx designated critical habitat in the action area

Much of the following analysis appears in the Canada lynx biological assessment and is relevant here. The primary difference is the action area. Critical habitat, however, occurs only on a portion of the planning area, reflected in the different action area for this assessment. In circumstances below, detailed discussions of actions covered above in the lynx assessment will not be duplicated here, rather referenced, only those differing effects specific to critical habitat (the PCE) will be presented and discussed.

Designated areas

The 2020 Forest Plan will change some area designations in the action area. These designations will influence the management activities that would be allowed or prohibited; thus, they can greatly influence management of critical habitat. The 2020 Forest Plan will increase the amount of land in critical habitat that is recommended for wilderness designation by 53,011 acres (Table 32). By recommending these new acres for wilderness designation, it will remove the area from potential timber production, reducing the overall amount of forest that could be subject to vegetation management that could reduce the amount of PCE 1a. Conversely, it would preclude vegetation treatment that would promote PCE 1a in areas where this component is underrepresented or of low quality. Additionally, a new recreation area has been proposed in critical habitat, the South Hills Recreation Area in the Divide GA at 50,180 acres, with 13,726 acres occurring in critical habitat (approximately 1% of critical habitat). Plan components for this recreation area (DI-SHRA-GDL-01, DI-SHRA-SUIT-01) allows for vegetation management and timber harvest to occur in this area. These activities will need to follow the provision of the NRLMD and other wildlife-based revised plan components, but there remains the potential for adverse effects to the PCE through these activities by reducing the amount of PCE 1a, as well as contributing to reductions in PCE 1b, c, and d through snow compaction and vegetation management. Effects to PCE 1b, c, and d are anticipated to be insignificant and discountable. Effects to the PCE from these area designations are mostly insignificant, and where such effects could be adverse, would result from vegetation management (discussed below) not the area designation itself.

Table 32. Area designations in the Canada lynx designated critical habitat action area under the preferred alternative for the 2020 Forest Plan

Designated area	Acres critical habitat	Percent
Congressionally Designated		
Wilderness areas	520,911	47%
Wilderness study areas	0	0%
Inventoried roadless areas	463,101	42%
Conservation management area	129,598	12%
Administratively designated in preferred alternative		
Recommended wilderness areas	53,011	5%
Research natural areas	3,283	<1%
South hills recreation area	13,726	1%

Vegetation management

A majority of critical habitat occurs in areas that have designations that mostly preclude vegetation management that is capable of diminishing the quality of critical habitat. Of the 1,099,991 acres of critical habitat in the action area, 463,051 acres (42%) would be available for timber harvest. This equates to a reduction in the area available for treatment in critical habitat by approximately 2% (Table 27). Timber

production would be allowable on 61,024 acres of critical habitat. This is a reduction in the area available for treatment by approximately 1% (Table 27). While these reductions allow for natural processes to be the dominant driver of vegetation conditions across more than half of the action area, it also precludes management activities that could improve certain habitat conditions for lynx, thus contributing to certain components of the PCE (PCE 1 a, c for example). In areas where vegetation management could be undertaken in critical habitat, there is potential for adverse effects to critical habitat by altering the conditions of the PCE. PCE 1 a, c, and d are most likely to be impacted through vegetation management. Adverse effects are likely to occur to PCE 1a due to the removal or alteration of vegetation preferred by snowshoe hare, but adverse effects are not anticipated to 1b, 1c, or 1d. Minor amounts of PCE 1b could be impacted during winter logging activities and fuel breaks where snow would be compacted my machinery and vehicles, but these effects are anticipated to be insignificant.

Presence of snowshoe hares and their preferred habitat conditions, which include dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface can be affected by forest vegetation management activities. Vegetation management standards and guidelines apply to vegetation management actions in occupied lynx habitat, and are intended to avoid, reduce or eliminate adverse effects of vegetation management actions. However, the NRLMD allows exemptions and exceptions from standards VEG S1, S2, S5, and S6 for treatments in the WUI and for other resource benefit.

VEG S1 is applied during planning of vegetation management projects at the scale of an individual LAU. It requires the Forest to not increase the amount of lynx habitat (which includes designated critical habitat) in a structural stage that does not yet provide winter snowshoe hare habitat if 30% or more of the habitat in that LAU is already in that state. VEG S2 is also applied during project planning and at the scale of an individual LAU. It limits timber management actions in lynx habitat (PCE 1a) that regenerate forest stands and therefore result in stand initiation structural stage condition to no more than 15% per LAU over a 10-year period.

Unless exemptions to these standards are applied, VEG S1 and S2 limit the amount of PCE 1a within individual LAUs that can be in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat and promotes a mosaic of structural stages at the landscape scale that supports preferred habitat conditions for snowshoe hare.

VEG S5 precludes pre-commercial thinning of young forests in the stand initiation structural stage within lynx habitat (PCE 1a) until tree limbs in these young stands self-prune and no longer provide browse and cover for snowshoe hare during the winter.

VEG S6 applies to forests in multistoried and late successional structural stages in lynx habitat (PCE 1a). The standard precludes vegetation management actions that would reduce snowshoe hare habitat in multistoried mature or late successional forests that provide habitat for snowshoe hare (and lynx) during winter.

Vegetation management standards VEG S5 and VEG S6 avoid adverse effects to PCE 1a from vegetation management activities and promotes a mosaic of habitat conditions for snowshoe hares by maintaining forest structural conditions within young regenerating and multistoried stands most preferred by snowshoe hare and lynx.

The proposed action includes an objective (FW-FIRE-OBJ-01) to treat hazardous fuels within the Wildland-Urban Interface, and an objective (FW-PLANT-OBJ-01) to treat vegetation to sustain or restore whitebark pine. Although the size, location, and nature of treatments is not known and would be determined as individual projects are planned, the HLC NF has estimated the total acreage that may be treated using the NRLMD exemptions and exceptions over the life of the plan (Table 33). In its BO regarding critical habitat and the NRLMD (U.S. Department of the Interior, Fish and Wildlife Service,

2017b) the Service identified a combined acreage of treatments that may occur in critical habitat between the Helena and Lewis and Clark NFs. This combined acreage amounted to 41,756 acres of treatment, having been adjusted for critical habitat, using the WUI exemptions and other resource benefit exceptions to the NRLMD vegetation standards. The Forest now anticipates treatments using the WUI exemptions and other resource benefit exceptions to the NRLMD vegetation standards to occur on 42,499 acres of critical habitat PCE 1a. This represents an increase of 743 acres (<0.02%) in the anticipated amount of treatment that may occur over the life of the proposed action (15 years).

Table 33. Acres of Canada lynx designated critical habitat PCE 1a anticipated for treatment throughout the life of the proposed action, adjusted

Critical habitat			Acres anticipated for treatment critical habitat	
Acres potential lynx habitat	Acres WUI	Acres potential lynx habitat in WUI	WUI exemption	Other resource benefit exception
715,695	259,107	148,675	38,142	4,357

The effects to lynx and lynx habitat of using the WUI exemptions and other resource benefit exceptions would be analyzed for individual projects based on habitat, size, location, and other factors. Only 9.6 percent of potential lynx habitat in the action area is outside of highly-to-moderately restrictive management (e.g., designated wilderness, IRA, Conservation Management Area, recommended wilderness, etc.), so adverse effects to PCE 1a through management actions would be limited in scale. Moreover, project activities occurring in PCE 1a would adhere to the standards and guidelines in the NRLMD, which are designed to minimize adverse effects to lynx habitat.

Plan components in the proposed federal action (FW-VEGT-DC-01, 03; FW-WL-DC-01; DI-VEGF-DC-04; RM-VEGF-DC-04; UB-VEGF-DC-04) would provide for PCE 1a across the action area when applied to planning and implementation of projects and management actions.

The application of the above plan components (Table 31) and the NRLMD would preclude or diminish the level of potential effect to the PCE and its components when vegetation management occurs under the 2020 Forest Plan. If adverse effects occur, they would be limited to localized areas and would not be present across the entirety of the Forest's portion of critical habitat unit 3.

Matrix habitat, PCE 1d, can be impacted by vegetation management and wildland fire management, but it will be covered here mostly since the majority of matrix habitat treated in the action area has been for the purpose of vegetation management. Matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range can be affected by forest management activities. Most management actions on NFS lands within critical habitat have the potential to impact PCE 1d, including vegetation management, wildland fire management, recreational development and associated infrastructure (ski areas), mine development, grazing management, and projects that affect linkage areas. Matrix habitat is not thought to be limiting to lynx (Interagency Lynx Biology Team, 2013), and activities that change vegetation structure and condition of matrix habitat are not considered to have an adverse effect to critical habitat unless they create a barrier or impede lynx movement between patches of foraging habitat, or between denning and foraging habitat (ibid). However, plan components exist (FW-WL-DC-09; FW-WL-GO-04) that would provide for linkage areas and connectivity. Furthermore, plan components in the proposed federal action (FW-VEGT-DC-01, 03; FW-WL-DC-01; DI-VEGF-DC-04; RM-VEGF-DC-04; UB-VEGF-DC-04; DI-WL-DC-01; RM-WL-DC-01; UB-WL-DC-01) would provide for PCE 1d across the action area.

While there is potential for vegetation management activities, along with wildland fire management, recreation, and other activities allowed in the 2020 Forest Plan, to affect matrix habitat, these effects would not be adverse because existing plan components and the NRLMD would preclude such effects. In addition, matrix habitat would not be degraded to such a point as to impede lynx movement or create barriers to lynx movement across and within the action area.

Wildland fire management

Fire and other natural disturbance processes historically played an important role in maintaining a mosaic of forest successional stages that provides habitat for both snowshoe hare and lynx (Ruediger, Claar, et al., 2000a), and the primary constituent element (PCE) for lynx critical habitat (U.S. Department of the Interior, Fish and Wildlife Service, 2014c). The NRLMD identified four primary objectives for vegetation management that describe desired conditions for lynx habitat; all four were adapted from conservation recommendations in the LCAS (Ruediger, Claar, et al., 2000a), and focus on providing a mosaic of forest structural stages that provide habitat for snowshoe hare and lynx, and directly address the PCE for lynx.

Objective VEG 03 is the only plan component in the NRLMD that specifically addresses wildland fire use (the management of naturally ignited wildland fires to accomplish resource management objectives) and prescribed fire. Objective VEG O3 directs managers to use fire to restore ecological processes to maintain or improve lynx habitat. The proposed action also includes components that would emphasize allowing fire to play its natural ecological role (FW-FIRE-DC-01, FW-FIRE-GDL-02), with guidance to manage risk or protect resources in some areas (FW-FIRE-DC-02 and 03; GO-02 and 03; GDL-01, 03, and OJB-01). Area designations such as designated wilderness, IRA, RWA, and Conservation Management Area influence decisions about and methods used in management of fire. The potential for individual wildfires to have beneficial or adverse effects on snowshoe hare habitat quality, lynx population dynamics, and the lynx critical habitat PCE depends on the local habitat conditions where wildfires occur, fire behavior, weather, and climate. Naturally ignited fires may occur anywhere on the HLC NF; area designations and plan components in the proposed action would guide decisions regarding management of those fires. The actual impacts of naturally ignited fires, however, are often determined more by topography, vegetation, local weather conditions, and climate than by attempted management.

Over a third of potential lynx habitat in the action area has been shaped by wildland fire (Table 30), and the present condition of critical habitat reflects that. Of the 1,099,991 acres of national forest lands that make up the critical habitat action area, 304,039 acres of potential lynx habitat have been impacted by wildfire from 1987-2018. At the programmatic scale, PCE 1c is most likely to be affected by wildland fire management activities, with other minor portions being impacted by vegetation management activities.

Sites for denning that have abundant coarse woody debris, such as downed trees and root wads can be affected by forest management activities. Such activities include wildland fire management. Denning sites are most commonly found in (or immediately adjacent to) stands with high horizontal cover and large woody debris (Interagency Lynx Biology Team, 2013), and within mature conifer or older regenerating stands within or immediately adjacent to foraging habitat. In Montana, lynx den sites were also found under large root wads and within dense patches of dead trees of small diameter (Squires et al., 2010). Denning habitat does not appear to be limited across the action area based on the Forest's lynx habitat modelling (Table 15).

Wildland fire management activities include fire use, fire suppression, and fire management. These activities can determine the presence or abundance of downed woody material for denning habitat. Fire use can either create or consume downed woody material used by lynx for denning. Only about 9.6 percent of potential lynx habitat in the action area outside of highly-to-moderately restrictive management (such as designated wilderness, IRAs, Conservation Management Area, recommended wilderness, and others). Therefore, any effects to PCE 1c through management actions guided or constrained by the proposed action are anticipated to be insignificant and discountable. As discussed above, the proposed

action does not authorize any actions, but directs that the standards and guidelines in the NRLMD would be applied to management actions. The proposed action also includes plan components (FW-VEGT-DC-01, 03; FW-WL-DC-01, 02, 03, 09; DI-VEGF-DC-04; RM-VEGF-DC-04; UB-VEGF-DC-04) that would provide down woody material for lynx denning habitat.

Wildfire activity that may occur in the action area has the potential to impact denning habitat by burning downed woody materials. While some amount of woody material can be affected by wildland fire management at localized scales, downed woody material is not presently considered limited in the action area (ibid). Thus, there would be denning sites available for lynx to use across much of the action area. Therefore, any effects to PCE 1c from wildland fire management and vegetation management would be insignificant and discountable.

Other allowable uses

In this subsection, other allowable or prohibited activities and uses will be addressed that have the potential to affect critical habitat. These include recreation, livestock grazing, and minerals and energy development. Since much of these activities and uses will remain mostly unchanged from the present condition, or do not represent activities that are likely to be adverse to critical habitat there will be little potential effect to critical habitat from their continuation in the 2020 Forest Plan.

Recreation

Winter conditions that provide and maintain deep fluffy snow for extended periods (PCE 1b) are not typically influenced by forest management practices at large scales, as these are a function of topography and climate. However, management actions can result in snow compaction at localized scales most often through creation or designation of over-the-snow routes, which can promote and increase use by competing predators, and/or increase the potential for predation on lynx by larger carnivores such as mountain lions and wolves. Management activities on NFS lands within the action area that have the potential to impact the presence of deep, fluffy snow are primarily related to developed and dispersed recreation (cross country skiing, dog sledding, ski area developments, snowmobiling, and snowshoeing).

The 2020 Forest Plan identifies two existing alpine ski areas, one of which is in designated critical habitat: Teton Pass Ski Area on the Rocky Mountain Range GA. The potential effects to lynx critical habitat were analyzed in the 2017 consultation discussed in the "Consultation History" section of this assessment and are covered in the above lynx assessment (see page 87). In summary, ski areas have the potential to reduce snowshoe hare habitat (PCE 1a) and fragment contiguous lynx habitat (PCE 1a, c, and d), while contributing to snow compaction (PCE 1b). Delineation of permit areas, identification of uses and activities allowed in each area, and other management actions would be planned when permits and operating plans are developed. Potential impacts of activities and management actions would be analyzed and consulted on at that time.

The proposed action delineates areas where specific Recreation Opportunity Spectrum (ROS) categories would apply; these categories indicate the types of uses that would be suitable, including winter motorized over-snow use. Approximately 145,911 acres (20%) of lynx critical habitat would be in ROS categories where over-snow motorized uses could potentially be allowed during winter. That represents the overall maximum area where such uses could be allowed, without consideration of terrain, access, vegetation, or other landscape characteristics that influence potential for winter motorized use. The potential effects to PCE 1c from this ROS designation would be an area of forest where compacted snow could occur as a result of snowmobile trail grooming activities and compaction from snowmobiles and other activities such as skiing across country where those activities are authorized. These effects would be insignificant to PCE 1c. The actual area (specific locations and acreages) in which winter over-snow motorized travel may occur is determined in travel management plans, and effects are analyzed and consulted on when those plans are made or updated.

Although the proposed action does not authorize activities at ski areas and does not make travel management decisions, the guidance it provides would allow for some snow compacting activities to occur in lynx critical habitat when those decisions are made. Eighty percent of lynx critical habitat on the HLC NF would not be available for winter motorized over-snow travel, and ski area impacts would continue to be limited to the existing permit boundary of the Teton Pass Ski Area. Therefore, the status of PCE 1b is more likely to be influenced by interannual variations in climate and climate change rather than by forest management activities throughout the life of the proposed action. Thus, any potential effects to PCE 1b that may result from allowable or prohibited motorized and nonmotorized recreation activities under the 2020 Forest Plan are insignificant and discountable.

Livestock grazing

Livestock grazing that occurs in critical habitat would continue under the 2020 Forest Plan at current levels and would not be increased from the present condition. While there is some potential for competition between cattle and snowshoe hare for dense herbaceous vegetation (PCE 1a), these effects would be insignificant and discountable because they would occur at small, localized scales not at a level that would diminish the presence of snowshoe hares or their preferred habitat conditions in the boreal forest across the action area.

Minerals and energy development

As stated in the 2020 Forest Plan "The FS has a minerals management mission to encourage, facilitate, and administer the orderly exploration, development, and production of mineral and energy resources on NFS lands to help meet the present and future needs of the Nation. The right of reasonable access for purposes of prospecting, locating, and mining is provided by statute. Such access must be in accordance with the rules and regulations of the FS. Management of mineral and energy resources has been defined by federal laws, regulations, and legal decision". Thus, minerals and energy resources will be available on Forest lands within the terms of law governing these resources. Because such resources are available for use, there remains potential for effect to critical habitat. Such effects could result from surface development of mineral and energy resources where habitat could be converted or lost. This habitat includes all components of the PCE, depending on the size and location of any potential development. The revised plan includes components (FW-EMIN-GDL-01, 02) that would provide guidelines for operators to take practicable measures to maintain, protect, and rehabilitate fish and wildlife habitat that may be affected by operations. The 2020 Forest Plan does not contemplate any mineral and energy development that would diminish the quality of critical habitat at a scale proportionate to the large landscape used by lynx. While there is potential for adverse effects to the PCE from such developments, the size, location, duration, and extent of such activity cannot be predicted and would be analyzed and consulted on at the project level during the section 7 consultation process.

Cumulative effects

Cumulative effects include non-federal (state, tribal, local, or private) actions that are reasonably certain to occur in the action area. There are approximately 26,271 acres of state, county, or private lands (Table 34) that occur in critical habitat within the HLC NF administrative boundary (action area). Only 10,292 acres of those are potential lynx habitat, representing a total of less than 2% of critical habitat in the action area in non-federal ownership. The quality of lynx habitat in these areas is unknown.

Table 34. Canada lynx designated critical habitat in the action area under nonfederal ownership

Ownership	Acres in critical habitat	Acres potential lynx habitat	Percent of action area
State	6	1	<1%
Private	26,264	10,286	2%
County	1	5	<1%

Ownership	Acres in critical habitat	Acres potential lynx habitat	Percent of action area
TOTAL	26,271	10,292	2%

Actions on nonfederal lands such as vegetation projects, wildland fire management, fuels treatment projects, and development (recreation, mineral, energy, etc.) have the potential to affect the PCE by reducing presence of snowshoe hare and their preferred habitat conditions, reducing and compacting areas of deep, fluffy snow, reducing availability of den sites through removal of coarse woody debris, and impacting availability and juxtaposition of matrix habitat.

Development of private lands to support increased human populations may continue and could reduce habitat connectivity in matrix habitat between blocks of lynx habitat. Since new developments would likely occur at lower elevations, adverse effects on matrix habitat would likely be insignificant.

Deep fluffy snow could potentially be impacted by future climate, but uncertainty remains as to the degree of potential effect. The Canada lynx species status assessment (2017c) describes projected climate models in northwestern Montana and northeast Idaho to maintain snow into the future. Forecasted annual average duration of snowpack by Mills and Johnson (2013) shows a decrease of 29–35 days by midcentury. If snowpack decreases over time or does not persist as long over each winter period, lynx may lose a competitive hunting advantage for prey resources.

Denning habitat is not limited across critical habitat unit 3 (U.S. Department of the Interior, Fish and Wildlife Service, 2014c) or the action area, therefore, any changes to denning habitat on nonfederal lands would not result in cumulative adverse effects to lynx.

There are several state, federal, or county roads within critical habitat in the action area. Any maintenance, expansion, reroute, or other action that alter vegetation along or near these roads may contribute to habitat fragmentation and decreased landscape connectivity. Additionally, improvements or expansions on these routes may result in increases in traffic volume or speed, increasing the cumulative potential for collisions between vehicles and lynx.

These cumulative effects have the potential to add to any effects that could result from designations and management guidance included in the proposed action, including adding to any potential adverse effects.

Determination of effects

Implementation of the proposed federal action *May Affect and is Likely to Adversely Affect* Canada lynx designated critical habitat; however, components of the PCE will continue to be well distributed and available to individual lynx to use in the action area throughout the life of the proposed action.

Rationale for determination

Within Canada lynx critical habitat unit 3, the proposed framework programmatic action would generally contribute to maintaining boreal forest landscapes with a mosaic of differing forest successional stages providing the physical or biological features essential to the conservation and recovery of the Canada lynx population.

Although the proposed action does not authorize specific vegetation management or other actions, it provides broad guidance regarding the areas where those activities may occur, provides direction to achieve desired conditions, and requires constraints on specific actions or impacts. The proposed action broadly indicates the areas in which timber production, timber harvest, recreation including motorized travel, and other uses can occur. Although we cannot predict the precise location of future projects or management actions, we conclude that implementation of the proposed action may affect, and is likely to

adversely affect Canada lynx designated critical habitat. Adverse effects are anticipated to result primarily from the treatment or manipulation of vegetation that reduces or eliminates PCE 1a. Objectives for fuels treatments, whitebark pine, and aspen restoration would likely require use of exemptions and exceptions to vegetation standards in the NRLMD, potentially adversely impacting snowshoe hare habitat (PCE 1a). Insignificant effects to denning habitat (PCE 1c) and matrix habitat (PCE 1d) may also occur, depending on the location of projects and types of activities. Naturally ignited fires may occur anywhere on the HLC NF; area designations and plan components in the proposed action would guide decisions regarding management of those fires. The impacts of both wildland fire suppression and prescribed fire used to achieve desired conditions included in the proposed action could also result in adverse impacts to snowshoe hare habitat (PCE 1a) and insignificant and discountable effects to denning habitat (PCE 1c) and matrix habitat (PCE 1d).

Designations made in the proposed action, such as recommended wilderness and ROS, combined with Congressional designations (e.g. designated wilderness, IRA, CMA) would limit the potential for snow compaction caused by over-snow motorized use and help to maintain deep, fluffy snow (PCE 1b), although some compaction will associated with winter recreation and winter period vegetation management. This snow compaction is anticipated to result in insignificant and discountable effects to PCE 1b. Designations, supported by plan components specifically addressing linkage and connectivity, would help to maintain both matrix habitat (PCE 1d) and connectivity within lynx critical habitat.

All future activities in Canada lynx designated critical habitat would be subject to the programmatic direction provided in the 2020 Forest Plan and NRLMD. Furthermore, these future activities would be subject to the section 7 consultation process at the project level to determine site-specific effects to critical habitat.

North American wolverine

Consultation history

Routine projects on NFS lands (2014, 2016)

On May 2014, the USFS Northern Region determined through a programmatic BA that a variety of projects routinely conducted on NFS lands are not likely to jeopardize the continued existence of the distinct population segment (DPS) of wolverine in the contiguous US. The USFWS originally concurred with this finding on May 23, 2014, and again on June 15, 2016. The analysis in the programmatic BA applies to wolverine only under its status as a proposed species. The action area for the programmatic BA included all NFS lands in the Northern Region, including the HLC NF. The routine activities included the general categories of: timber harvest, mechanical equipment use, existing gravel pit use, roads and road maintenance, silvicultural activities, range management, recreation management, forest products, habitat maintenance and restoration, prescribed fire, watershed restoration, weed control, and administrative and non-recreational special uses. Most of these activities are types of human use and disturbances, which the USFWS found in their listing proposal do not threaten the existence of wolverine in the contiguous US.

Species status and ecological information

Status

The subspecies of wolverine in the New World is *Gulo gulo luscus*, also known as the North American wolverine. All wolverines in the contiguous US, Alaska, and Canada belong to that subspecies.

The DPS of wolverine in the contiguous US is currently proposed as threatened under the ESA. This status applies wherever wolverine occur in the contiguous US, including the action area of the HLC NF.

The USFWS first proposed listing this DPS in 2013. They then withdrew the proposal in 2014, after concluding that the factors identified in the proposed rule were not as significant as believed earlier.

In 2016, the US District Court in Montana vacated the withdrawal and remanded the matter back to the USFWS for further consideration. This effectively reverted the status of wolverine back to proposed as threatened in the contiguous US (U.S. Department of the Interior, Fish and Wildlife Service, 2016b).

Critical habitat has not been proposed for wolverine in the contiguous US.

Habitat requirements and life history

Wolverines are associated with tundra and boreal forest biomes across the northern hemisphere (Banci, 1994a). They do not appear to specialize on specific vegetation or geological habitat aspects, but instead select areas that are climatically cold and reliably provide deep snow through the maternal denning period, which ends in late spring (Copeland et al., 2010).

In the contiguous US, these conditions are restricted to high elevation alpine and subalpine habitats (around tree-line) of large western mountain ranges such as the Rocky Mountains, North Cascade Range, and Sierra Nevada Mountains. Mean seasonal elevations of wolverines in the northern Rocky Mountains and North Cascade Range vary between about 4,500 and 8,500 feet, depending on location, but are always relatively high on mountain slopes (U.S. Department of the Interior, Fish and Wildlife Service, 2016b).

Due to the harsh conditions and low productivity of high elevation habitats, wolverines tend to have large home ranges and low reproductive rates. However, they are food generalists, preying on a variety of small animals, scavenging carrion, and consuming fruits, berries, and invertebrates (Banci, 1994b; Hornocker & Hash, 1981).

The average home ranges in Glacier National Park (adjacent to the Rocky Mountain GA) were estimated at 55 square miles for females, and 193 square miles for males (U.S. Department of the Interior, Fish and Wildlife Service, 2013). Further south, in the GYE, home ranges were larger at 128 and 311 square miles for males and females, respectively, possibly due to lower resource availability (Robert M. Inman et al., 2012).

Wolverines, particularly young males, may move large distances across less optimal habitats in an attempt to establish new home ranges. Dispersing individuals do not appear to require any specific vegetation or terrain features, and it does not appear that infrastructure such as transportation corridors or urban developments are a threat (U.S. Department of the Interior, Fish and Wildlife Service, 2013). Probability of dispersal is likely affected by the distance and climatic conditions between suitable habitat patches (M. K. Schwartz et al., 2009). While these movements can be important for gene flow in some areas, in other areas they may lead to a “sink” where insufficient habitat exists to support a reproducing population (U.S. Department of the Interior, Fish and Wildlife Service, 2013).

Population status and distribution of the distinct population segment

The contiguous US is the southern extent of the wolverine’s range in North American. There are currently two main population centers: the northern Rocky Mountains in Montana, Idaho, and Wyoming (including the GYE), and the North Cascades in Washington. The bulk of animals occur in the northern Rocky Mountains, likely as a metapopulation, with intermittent exchange of individuals among semi-isolated subpopulations (U.S. Department of the Interior, Fish and Wildlife Service, 2013).

The northern Rockies population was reduced to historical lows or possibly even extirpated during the early 1900s when intense predator control was implemented, and then rebounded in the second half of the 1900s as this campaign subsided. Recovery occurred through natural means (reproduction and/or recolonization from Canada), and was not aided by translocations. The North Cascades population likely

was extirpated and naturally re-colonized from populations in Canada. Reproduction was documented for the first time there in 2012. The North Cascades may be dependent on the larger Canadian population for expansion and long-term persistence (U.S. Department of the Interior, Fish and Wildlife Service, 2013).

Approximately 47,882 mi2 of wolverine habitat exists in the northern Rocky Mountains (including the peripheral Wallowa Mountains in Oregon). Habitat in Washington adds approximately 7859 mi2 to the total amount of habitat. Ninety-four percent (52,277 mi2) of total wolverine habitat is in Federal ownership, with most of that managed by the USFS.

Historical records suggest wolverine populations previously existed in parts of the southern Rocky Mountains (Colorado) and the Sierra Nevada Mountains (California), but these were likely extirpated during predator control campaigns in the early 1900's. Occasionally, individual wolverines are reported in these areas, but there is no evidence that these are more than individual dispersing males, or that reproduction is occurring (U.S. Department of the Interior, Fish and Wildlife Service, 2013).

Existing condition

Population status and distribution in the plan area

The action area falls wholly within the northern Rocky Mountains wolverine population center.

Wolverine have been documented in all GAs of the action area except the Highwoods and Snowies, although the Elkhorns, Crazies and Castles each have only one old (>25yrs) record. Wolverines were recently estimated to be at population capacity within the Northern Continental Divide Ecosystem portion of the northern US Rocky Mountains (Robert Michael Inman, 2013). This includes the Bob Marshall Wilderness Area, where most of the HLC NF habitat is (i.e., in the Rocky Mountain Range and Upper Blackfoot GAs). However, not all of the remaining areas with wolverine records are thought to have potential to support reproduction (see Habitat section below).

Habitat in the action area

Two separate models were used to identify wolverine habitat in the action area. One is based on "primary" and "maternal" habitats used by adult radio-collared wolverine in the GYA (Robert Michael Inman, 2013; R. M. Inman et al., 2012). The second (persistent snow model) is based on broader research showing that females appear to require snow cover that persists into May for successful reproduction (Copeland et al., 2010).

The first model suggests the HLC NF has about 1 million acres of primary habitat and 358,000 acres of maternal habitat (Table 35). Most of this in Wilderness and other congressionally designated areas. For example, 96% of all maternal habitat is in some form of congressionally designated area, with 65% being in Wilderness Areas. The Rocky Mountain Range GA is of particular importance for both primary and maternal habitats (Table 36).

The persistent snow model also shows a high degree of overlap with congressionally designated areas. For example, areas with the most reliable snow (>7 consecutive years) are contained fully within wilderness, inventoried roadless, or conservation management areas (Table 35). Only the Rocky Mountain Range and Upper Blackfoot GAs provide the most reliable snow (Table 36) These two GAs are connected to the Flathead NF and Glacier National Park, both of which also contain wolverine habitat. This provides a large area of primary habitat that has high connectivity. The other GAs on the HLC NF do not reliably have persistent snow (including the Little Belts, which has the most modeled primary habitat after the combined and connected Rocky Mountain Range and Upper Blackfoot GAs), suggesting that wolverine may not be consistently present or be reproducing in those areas. All areas providing reliable snow have congressional designation.

Based on habitat models, the role of GAs other than the Rocky Mountain Range and Upper Blackfoot in contributing to the larger wolverine population is questionable. For example, the Highwoods, Snowies, and Castles GAs may not have enough potential habitat to support even a single wolverine, in addition to being isolated from larger GAs with more habitat. This is corroborated by the lack of records in those areas.

Table 35. Acres of wolverine habitat in the action area, and within designated wilderness area, IRA, and conservation management area, by wolverine habitat category. Percentages of the total habitat in action area are given in parentheses

Wolverine habitat category[1]		Total habitat in action area	Habitat in congressionally designated areas		
		Wilderness area[2]	Inventoried roadless area[2]	Conservation management area[2]	Total habitat in wilderness, inventoried roadless, or conservation management areas[3]
Primary	1,010,243	412,363 (41%)	503,504 (50%)	73,643 (7%)	874,543 (87%)
Maternal	357,795	231,837 (65%)	123,442 (35%)	12,720 (4%)	342,290 (96%)
Persistent Spring Snow 1 of 7 years	393,880	101,349 (26%)	217,978 (55%)	39,087 (10%)	308,863 (78%)
Persistent Spring Snow 7 of 7 years	46,672	35,664 (76%)	11,164 (24%)	252 (1%)	46,672 (100%)

[1.] Primary and maternal habitats were mapped using methods described by Inman (Robert M. Inman, Bergen, & Beckman, 2013); spring snow habitat was mapped using methods described by Copeland (Copeland et al., 2010) and includes areas with persistent snow in at least 1 of 7 years, and in 7 of 7 years, to display a possible range.
[2.] Numbers in these columns include some overlap with each other, due to overlapping congressional designations. However, they are shown because additional constraints apply. Note these columns will not total to 100% or to the total habitat in all congressionally designated areas (far right column).
[3.] These numbers do not include overlap among congressionally designated areas.

Table 36. Percent of wolverine habitat categories by geographic area

Geographic area	Wolverine habitat category[1]			
	Primary	Maternal	Persistent spring snow 1 of 7 years	Persistent spring snow 7 of 7 years
Rocky Mountain Range	49%	69%	42%	76%
Upper Blackfoot	14%	18%	9%	24%
Little Belts	20%	6%	28%	0%
All other GAs combined	17%	3%	21%	0%

[1] Primary and maternal habitats were mapped using methods described by Inman (Robert M. Inman et al., 2013); spring snow habitat was mapped using methods described by Copeland (Copeland et al., 2010) and includes areas with persistent snow in at least 1 of 7 years, and in 7 of 7 years, to display a possible range.

Factors affecting the distinct population segment of wolverine in the contiguous US

The original listing proposal considered future climate-induced loss or reduction of areas with persistent spring snow to be the most important threat to wolverine populations (U.S. Department of the Interior, Fish and Wildlife Service, 2013). The withdrawal of this listing proposal was based in part on uncertainties of predicting wolverine response to forecasted changes (U.S. Department of the Interior, Fish and Wildlife Service, 2014a).

Secondary threats to wolverine in the contiguous US, when considered cumulatively with projected climate-induced habitat loss, are trapping, and demographic stochasticity and loss of genetic diversity due to small effective population sizes (U.S. Department of the Interior, Fish and Wildlife Service, 2013). All of these factors are outside of Forest Service control. At the time of the original listing proposal, trapping of wolverines in the contiguous US was authorized only in Montana. Since then, Montana has closed its wolverine trapping season, although incidental trapping might still occasionally occur.

The listing proposal examined many types of human uses and disturbances, and found them not to be a threat to wolverine populations in the contiguous US despite localized impacts sometimes occurring (U.S. Department of the Interior, Fish and Wildlife Service, 2013). This is because most wolverine habitat in the contiguous U.S. is not coincident with areas where intensive management occurs. Most wolverine habitat occurs in areas with protective land statuses such as designated wilderness and IRA, and also in high elevation, rugged areas (U.S. Department of the Interior, Fish and Wildlife Service, 2013). These features that discourage human use and disturbance within wolverine habitat are prevalent in the action area, and contain the vast majority of wolverine habitat (see Table 35).

Many types of human use and disturbances were examined in the listing proposal. While the proposal acknowledged that there could be some effect on habitat use, they were determined to be non-threatening to wolverines, with no population-level effects. This includes dispersed recreational activities, infrastructure development, transportation corridors, and land management (U.S. Department of the Interior, Fish and Wildlife Service, 2013, 2014a).

Researched published after the listing proposal supports and refines the listing proposal's assessment of disturbances. For example, one study in the continental US found wolverines maintained multi-year home ranges within landscapes having winter recreation, even when the recreation footprint covered >40% of the home ranges of some resident animals (Heinemeyer et al., 2019). However, wolverines in this study avoided portions of their home ranges where motorized or non-motorized winter recreation occurred. Avoidance increased as winter recreation intensity increased, and motorized uses were the most intense. Off-road recreation elicited a stronger response than recreation on roads, and females showed more sensitivity than males. This indicated wolverines may experience some degree of indirect, seasonal habitat loss in areas with winter recreational use. However, the amount of indirect habitat loss tended to plateau (i.e., not further increase) across home ranges having the highest levels of recreation use. While the impact of habitat avoidance on reproduction and survival could not be assessed in this study, the authors acknowledged that winter recreation patterns are highly variable at the scale of wolverine home ranges such that some animals (like those occurring in areas with little access or with motorized use restrictions) may experience few effects. The wolverine listing proposal found it unlikely that large areas of wolverine habitat experience high levels of recreation in most of the contiguous US (U.S. Department of the Interior, Fish and Wildlife Service, 2013), and thus did not considered it a threat to the species.

Recent research on boreal lands in Alberta managed for industrial uses found that wolverines were attracted to certain disturbances (Scrafford, Avgar, Abercrombie, Tigner, & Boyce, 2017). Wolverines were especially attracted to areas where active logging was occurring, and during the following summer. These same areas were avoided the summer before logging occurred. Old seismic lines and roadside borrow pits (which characteristically had intermediate tree regeneration and beavers, respectively) were also selected. The authors suggested these disturbed areas may have provided foraging opportunities for

wolverines, afforded protection from predation by wolves, or both. They also acknowledged that wolverine attraction to industrial features might lead to increased mortality, although they did not see population declines in their study area.

Recent research in Alberta showed that wolverines can both avoid and be attracted to roads, depending on the balance between risk and benefit. Wolverines there avoided low-traffic winter roads year-round, but were attracted to some higher traffic all-season roads (Scrafford et al., 2017). Avoidance was attributed to predation risk from wolves that use winter roads for movement. Attraction to all-season roads was thought to stem from elevated foraging opportunities and lower predation risk. During this study, three wolverines were killed by wolves. In a more focused analysis of that same study area, wolverines were found to use both speed and avoidance to reduce their time in roadside habitats, which could ultimately reduce road-related mortality (Scrafford, Avgar, Heeres, & Boyce, 2018).

Vegetation treatments and other land management activities also are not considered a threat to wolverines in part because wolverine do not appear to be dependent on specific vegetation or habitat features that might be manipulated by land management activities (U.S. Department of the Interior, Fish and Wildlife Service, 2013).

Environmental consequences

Area designations, access, and recreation opportunity

The Preferred Alternative F would maintain a high proportion of the action area's wolverine habitat in protective land status categories and designations, and thus continue to provide large areas with relatively low disturbance levels that are typically associated with wolverine habitats. This would occur through nonmotorized recreation settings and RWAs (Table 37), in addition to maintaining the large amount of habitat already encompassed by designated wilderness areas, IRAs, and CMAs.

About 6% of all primary wolverine habitat in the plan area would become RWA under alternative F, compared to 1% currently. Most RWAs overlap with IRAs. However, RWAs would be managed specifically to maintain a natural environment where ecological processes function as the primary forces affecting the environment (FW-RECWILD-DC-01, 02, 03), which aligns well with wolverine needs.

The large majority of wolverine habitats would continue to be within either primitive or semi-primitive non-motorized settings under the preferred alternative (Table 37). For example, 96% of the action area having modeled persistent spring snow 7 out of 7 years would be overlapped by non-motorized winter recreation settings. This high overlap reflects the relatively inaccessible nature of most key wolverine habitat. Plan components for the two non-motorized recreation settings stress limited presence and evidence of human activity (FW-ROS-DC 02, 03, 04, and 05 and associated standards and guidelines). The largest area of habitat that is relatively free of human disturbance occurs on the Rocky Mountain Range GA (refer to project file for acreages by GA). This GA also has the highest amount of mapped potential wolverine habitat (Table 36, above), and it is highly connected to wolverine habitat on the Flathead NF and in Glacier National Park.

Collectively, these area designations and categories provide high assurance that wolverine habitats in the action area remain largely free from human activities and disturbances. Maintaining large areas with these conditions could help mitigate, to some extent, habitat fragmentation caused by climate change. While some human activity would still occur that could cause some avoidance by wolverines (e.g., vegetation management, recreation), in general they would be unlikely to have a measurable effect on wolverines, based on analysis displayed in the listing proposal (U.S. Department of the Interior, Fish and Wildlife Service, 2013).

Table 37. Acres of RWAs, and combined primitive and semi-primitive nonmotorized ROS, by wolverine habitat category for the no action alternative (A) and the preferred alternative (F)

Area designation or category	Wolverine habitat[1]	Alternative A	Alternative F
Recommended Wilderness Areas[2]	Primary	11,792 (1%)	61,071 (6%)
	Maternal	1,384 (<1%)	6,845 (2%)
	Persistent Snow 1 of 7 years	6,407 (2%)	22,415 (6%)
	Persistent Snow 7 of 7 years	0	30 (<1%)
Combined Primitive and Semi-Primitive Non-Motorized Recreation Setting (Summer)	Primary	840,639 (83%)	837,598 (83%)
	Maternal	339,847 (95%)	339,457 (95%)
	Persistent Snow 1 of 7 years	288,118 (73%)	287,817 (73%)
	Persistent Snow 7 of 7 years	46,479 (100%)	46,479 (100%)
Combined Primitive and Semi-Primitive Non-Motorized Recreation Setting (Winter)	Primary	799,915 (79%)	811,932 (80%)
	Maternal	327,485 (92%)	328,477 (92%)
	Persistent Snow 1 of 7 years	291,923 (74%)	298,144 (76%)
	Persistent Snow 7 of 7 years	44,925 (96%)	44,925 (96%)

Alternative F would also adopt more specific plan components to promote conservation of wolverines and their habitats. This includes desired conditions to provide habitat connectivity for wolverine and other wide-ranging species between public lands in northern Montana and those in south and southwestern Montana, including lands in the GYE (DI-WL-DC-01, RM-WL-DC-01, UB-WL-DC-01, CR-WL-DC-01). Several goals would further this, by promoting work with other agencies and partners to identify and manage for wildlife movement across ownerships, and to collaborate on management and conservation strategies to conserve wildlife and prevent the need for additional listings under the ESA (FW-WL-GO-01, 02, and 04, 05, and 06). There are also desired conditions for maintaining wildlife habitat throughout native species' potential natural ranges and maintaining vegetation composition, structure, and distribution that would provide for wildlife habitat needs (FW-WL-DC-01 through 04), and a desired condition to minimize disturbance of species in key seasonal habitats, such as denning and pup-rearing areas (FW-WL-DC-06).

The proposed plan includes DCs to provide a variety of types of recreation opportunities while protecting other resources. The plan includes objectives for removing and rehabilitating recreations sites where resource damage or conflict has occurred (FW-REC-OBJ-01 through 04), and guidelines to manage recreation sites to be responsive to wildlife habitat needs or potential for conflict (FW-REC-GDL-01, FW-REC-GDL-07) and to prevent specific types of resource damage or conflict, with emphasis on riparian and aquatic ecosystems (FW-REC-GDL-03 through 06). The plan also includes statements about management activities that are suitable or not in various recreation sites.

The 2020 Forest Plan allows for various permitted uses, with guidance to reduce or mitigate conflicts with other uses and resources, including specific guidance to reduce the potential for human-wildlife conflict (FW-RSUP-GDL-01). Desired conditions in the plan include providing for public access to NFS lands via roads, trails, and airstrips (FW-ACCESS-DC-01 through 03). Goals and guidelines are included to address protection of other resources and provide for public safety. Plan components included in the 2020 Forest Plan from the grizzly bear amendments constrain increases in developed overnight recreation sites in the grizzly bear PCA and the amount of motorized access allowed in the grizzly bear PCA and Zone 1

(PCA-NCDE-STD-01 through 06); these components are discussed in more detail in the grizzly bear species assessment.

Vegetation management

Vegetation management programs under the new forest plan (such as timber harvest, prescribed burning, and grazing) would be largely confined to areas with road access, which is primarily outside of congressionally designated areas. This is approximately 13% of primary, 4% of maternal habitats, and 22% of areas with a minimal amount in modeled persistent snow (1 out of 7 years; see Table 35). No areas with reliable spring snow would be included. The original wolverine listing proposal reports few documented effects from vegetation management and cites examples of wolverine using areas recently logged or burned despite changes in vegetation conditions as seen on pages 78-79 of (U.S. Department of the Interior, Fish and Wildlife Service, 2013). More recent research supports this, and suggests that wolverine may actually find foraging benefits while active logging is occurring (Scrafford et al., 2017). 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, Fish and Wildlife Service, 2013). While it is possible that in some specific instances, vegetation management may indirectly affect individual wolverine through prey availability, predator abundance or interactions with humans, the potential area affected would be very small and unlikely to measurably affect the wolverine population in the contiguous US.

Minerals and energy development

Lands on the HLC NF are generally available for both locatable and leasable minerals exploration and development, with the exception of designated Wilderness areas, and areas that are either administratively or Congressionally withdrawn from those uses. The entire Rocky Mountain Range GA, which has approximately half of the plan area's wolverine primary habitat, two-thirds of its maternal habitat, and three-fourths of the most reliable spring snow, is withdrawn by act of Congress from future locatable or leasable minerals exploration or development. Wolverines would also benefit from plan components designed to minimize impacts of mineral and energy development to grizzly bear recovery, where habitat overlaps. Exploration and development plans elsewhere on the HLC NF, would be guided by site-specific analysis that would include consideration of wildlife, including wolverine habitat needs, to the extent allowed by legal mineral rights. Overall, the footprint associated with mineral and energy development is expected to be relatively small and not enough to measurably affect the wolverine population in the contiguous US.

Cumulative effects

The amount of mapped potential wolverine habitat on the HLC NF that occurs in non-federal ownership is very small: roughly 3% of habitat that has persistent snow in 1 of 7 years, no habitat with persistent snow in 7 of 7 years, 1% of mapped primary habitat and well under 1% of mapped maternal habitat is in non-federal ownership within the mapped HLC NF boundaries. Negligible amounts of wolverine habitat occur on non-federal land adjacent to or near the HLC NF boundary, as those areas are primarily low elevation.

Due to the rugged, high elevation habitats utilized by wolverines, and the high proportion of these habitats in federal ownership, there are no non-federal actions that are reasonably certain to occur in the action area that would potentially affect wolverines. Montana Fish, Wildlife and Parks does not have an open wolverine trapping season in the action area or other parts of Montana, and incidental trapping mortality is not reasonably certain to occur. Other non-federal actions would likely be similar in nature as those authorized under a Forest Plan, and thus, would not constitute major threats to the wolverine.

Determination of effects

Implementation of the proposed federal action *is not likely to jeopardize the continued existence* of the federally proposed threatened DPS of wolverine in the action area, which is the entire HLC NF.

Rationale for determination

This biological assessment analyzes the potential impacts to wolverines of implementing the programmatic Helena-Lewis and Clark National Forest revised land and resource management plan. Impacts to wolverines and their habitat have been considered in the context factors that may influence wolverine survival and habitat use.

The proposed action

- will not contribute to the identified Primary or Secondary threats to the wolverine DPS (climate change, inadequate regulation of climate change, harvest, and small population size)
- adds plan components designed to maintain or increase connectivity within and among wolverine habitats
- does not change the amount of designated wilderness, IRAs or CMAs, which are substantial in the plan area and provide large areas of relatively undisturbed habitats that have high connectivity to wolverine habitats on the Flathead NF and Glacier NP, and
- maintains or increases the proportion of wolverine habitats overlapped by RWA and non-motorized recreation settings, with associated plan components that minimize human presence and impacts in those areas.

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Appendix A. 2020 Forest Plan Components

Plan components referenced, by species

Table 38 crosswalks the plan components that are referenced in this BA for each species. The full text of all referenced plan components is provided in the following section.

Acronyms used to identify types of Plan components include: Desired Condition (DC); Goals (GO); Standards (STD); Guidelines (GDL); and Suitability (SUIT).

Table 38. Plan components referenced in species assessments

Plan component	General	Grizzly bear	Canada lynx	Wolverine
Watershed (WTR)				
FW-WTR-DC-02		X		
Fire and Fuels (FIRE)				
FW-FIRE-DC-01	X		X	
FW-FIRE-DC-02	X		X	
FW-FIRE-DC-03			X	
FW-FIRE-GO-02			X	
FW-FIRE-GO-03			X	
FW-FIRE-OBJ-01	X		X	
FW-FIRE-GDL-01	X		X	
FW-FIRE-GDL-02	X		X	
FW-FIRE-GDL-03			X	
Terrestrial Vegetation (VEGT)				
FW-VEGT-DC-01	X	X	X	
FW-VEGT-DC-02	X		X	
FW-VEGT-DC-03	X	X	X	
FW-VEGT-DC-04	X	X		
FW-VEGT-OBJ-01	X			
FW-VEGT-GDL-01	X			
FW-VEGT-GDL-02	X			
FW-VEGT-GDL-03	X			
FW-VEGT-GDL-04	X			
Forested Vegetation (VEGF)				
FW-VEGF-DC-01	X		X	
FW-VEGF-DC-02	X		X	
FW-VEGF-DC-03	X		X	
FW-VEGF-DC-04	X		X	
FW-VEGF-DC-05	X		X	
FW-VEGF-DC-06	X		X	
FW-VEGF-DC-07	X		X	
FW-VEGF-DC-08	X	X	X	
FW-VEGF-DC-09			X	

Plan component	General	Grizzly bear	Canada lynx	Wolverine
FW-VEGF-GDL-01	X			
FW-VEGF-GDL-02	X			
FW-VEGF-GDL-04	X			
FW-VEGF-GDL-05	X		X	
Nonforested Vegetation (VEGNF)				
FW-VEGNF-DC-01	X			
FW-VEGNF-DC-02	X			
FW-VEGNF-DC-03	X			
TEPC & SCC Plants (PLANT)				
FW-PLANT-DC-01	X	X		
FW-PLANT-DC-01	X			
FW-PLANT-GO-01	X			
FW-PLANT-OBJ-01	X	X	X	
FW-PLANT-GDL-01		X		
Wildlife (WL)				
FW-WL-DC-01	X		X	X
FW-WL-DC-02	X		X	X
FW-WL-DC-03	X	X	X	X
FW-WL-DC-04	X	X	X	X
FW-WL-DC-05	X	X		
FW-WL-DC-06	X			X
FW-WL-DC-09	X		X	
FW-WL-GO-01	X			X
FW-WL-GO-02	X			X
FW-WL-GO-03	X			
FW-WL-GO-04	X		X	X
FW-WL-GO-05	X			X
FW-WL-GO-06				X
NCDE Grizzly Bear Amendment				
All		X		
Recreation Settings (ROS)				
FW-ROS-DC-01	X			
FW-ROS-DC-02				X
FW-ROS-DC-03				X
FW-ROS-DC-04				X
FW-ROS-DC-05				X
Recreation Opportunities (REC)				
FW-REC-DC-01	X			
FW-REC-DC-02	X			
FW-REC-DC-03	X	X		
FW-REC-DC-04	X	X	X	

Plan component	General	Grizzly bear	Canada lynx	Wolverine
FW-REC-DC-05	X			
FW-REC-DC-06	X			
FW-REC-DC-07	X	X	X	
FW-REC-OBJ-01	X	X		
FW-REC-OBJ-02	X	X		
FW-REC-OBJ-03	X			
FW-REC-OBJ-04	X	X		
FW-REC-GDL-01	X		X	
FW-REC-GDL-03	X			
FW-REC-GDL-04	X			
FW-REC-GDL-05	X			
FW-REC-GDL-06	X			
FW-REC-GDL-07	X	X		
Recreation special uses (RSUP)				
FW-RSUP-DC-01		X		
FW-RSUP-DC-02		X		
FW-RSUP-DC-03		X		
FW-RSUP-GDL-01	X			
Recreation Access (ACCESS)				
FW-ACCESS-DC-01	X			
FW-ACCESS-DC-02	X			
FW-ACCESS-DC-03	X			
FW-ACCESS-GO-01	X			
FW-ACCESS-GDL-01	X	X		
FW-ACCESS-GDL-02	X			
Scenery (SCENERY)				
FW-SCENERY-DC-01	X			
FW-SCENERY-DC-02	X			
FW-SCENERY-DC-03	X			
FW-SCENERY-GDL-01	X			
Wilderness (WILD)				
All	X			
FW-WILD-DC-02		X		
FW-WILD-DC-03		X		
FW-WILD-SUIT-02			X	
Recommended Wilderness (RECWILD)				
All	X			
FW-RECWILD-DC-01				X
FW-RECWILD-DC-02		X		X
FW-RECWILD-DC-03				X
FW-RECWILD-STD-01		X		

Plan component	General	Grizzly bear	Canada lynx	Wolverine
FW-RECWILD-SUIT-01		X		
FW-RECWILD-SUIT-02		X		
FW-RECWILD-SUIT-03		X		
FW-RECWILD-SUIT-04		X		
FW-RECWILD-SUIT-05		X		
FW-RECWILD-SUIT-06		X	X	
FW-RECWILD-SUIT-07		X		
FW-RECWILD-SUIT-08		X		
Wilderness Study Areas (WSA)				
All	X			
FW-WSA-DC-01		X		
FW-WSA-SUIT-02		X		
FW-WSA-SUIT-04		X		
FW-WSA-SUIT-08		X		
FW-WSA-SUIT-05		X		
FW-WSA-SUIT-06		X		
Inventoried Roadless Areas (IRA)				
All	X			
FW-IRA-DC-01		X		
FW-IRA-DC-02		X		
Eligible Wild & Scenic Rivers (WSR)				
All	X			
FW-WSR-GDL-01			X	
Infrastructure: Roads (RT)				
FW-RT-DC-01			X	
FW-RT-DC-02		X		
FW-RT-DC-04		X	X	
FW-RT-GO-03		X	X	
FW-RT-OBJ-01		X		
FW-RT-OBJ-02		X		
FW-RT-GDL-12		X	X	
FW-RT-GDL-13		X		
Livestock Grazing (GRAZ)				
FW-GRAZ-DC-01	X		X	
FW-GRAZ-DC-02	X	X		
FW-GRAZ-DC-03	X		X	
FW-GRAZ-GO-01	X	X		
FW-GRAZ-STD-02	X		X	
FW-GRAZ-GDL-01	X			
FW-GRAZ-GDL-02	X			
FW-GRAZ-GDL-03	X			

Plan component	General	Grizzly bear	Canada lynx	Wolverine
FW-GRAZ-GDL-04	X			
FW-GRAZ-GDL-05	X			
FW-GRAZ-GDL-06	X			
FW-GRAZ-GDL-07	X			
Timber (TIM)				
FW-TIM-DC-01	X			
FW-TIM-DC-02	X			
FW-TIM-DC-03	X			
FW-TIM-DC-04	X			
FW-TIM-GO-01	X			
FW-TIM-OBJ-01	X			
FW-TIM-OBJ-02	X			
FW-TIM-STD-01	X			
FW-TIM-STD-02	X			
FW-TIM-STD-03	X			
FW-TIM-STD-04	X		X	
FW-TIM-STD-05	X			
FW-TIM-STD-06	X			
FW-TIM-STD-07	X			
FW-TIM-STD-08	X		X	
FW-TIM-STD-09	X			
FW-TIM-STD-10	X			
FW-TIM-GDL-01	X		X	
FW-TIM-GDL-02	X			
FW-TIM-GDL-03	X			
Fish and Wildlife (FWL)				
FW-FWL-DC-02			X	
FW-FWL-DC-04			X	
FW-FWL-GO-01	X			
FW-FWL-GDL-01	X			
Minerals and Energy (EMIN)				
FW-EMIN-DC-05	X	X	X	
FW-EMIN-DC-06	X		X	
FW-EMIN-GDL-01	X	X	X	
FW-EMIN-GDL-02	X	X	X	
Big Belts GA (BB)				
BB-WL-DC-03		X	X	
Crazies GA (CR)				
CR-WL-DC-01		X	X	X
Divide GA (DI)				
DI-VEGF-DC-04			X	
DI-WL-DC-01			X	X

Plan component	General	Grizzly bear	Canada lynx	Wolverine
DI-WL-GO-01		X	X	
DI-WL-GDL-01		X	X	
DI-SHRA-DC-01		X	X	
DI-SHRA-GDL-01			X	
DI-SHRA-SUIT-01			X	
DI-SHRA-SUIT-02		X	X	
Elkhorns GA/WMU (EH)				
EH-ACCESS-GDL-01		X		
EH-RT-STD-01		X		
EH-RT-STD-02		X		
EH-WL-DC-02		X	X	
Little Belts GA (LB)				
LB-SHOWSKI-DC-01			X	
LB-SHOWSKI-DC-02			X	
Rocky Mountain Range GA (RM)				
RM-VEGF-DC-04			X	
RM-WL-DC-01		X	X	X
RM-WL-STD-01		X		
RM-TETONSKI-DC-01			X	
RM-TETONSKI-DC-02			X	
RM-CMA-DC-01		X		
RM-CMA-DC-03		X		
RM-CMA-STD-01		X		
RM-CMA-STD-02		X		
Snowies GA (SN)				
SN-GVRA-DC-03		X	X	
SN-GVRA-SUIT-01			X	
SN-GVRA-SUIT-02			X	
Upper Blackfoot GA (UB)				
UB-VEGF-DC-04			X	
UB-WL-DC-01			X	X
UB-WL-GDL-01		X	X	
NRMLD (appx F of the Plan)				
All			X	

Full text of referenced plan components

Watershed (WTR)

Desired Conditions

FW-WTR-DC-02: Spatial connectivity exists within or between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, groundwater, wetlands, upslope areas, headwater

tributaries, and intact habitat refugia. These network connections provide chemically and physically unobstructed routes to areas critical for fulfilling the requirements of aquatic and riparian-associated plants and animals.

Fire and Fuels Management (FIRE)

Desired Conditions

FW-FIRE-DC-01: Wildfire maintains and enhances resources and, as nearly as possible, is allowed to function in its natural ecological role across the landscape, including wilderness. Under favorable conditions, wildfires and prescribed fires are managed to ensure highest probability of success, minimum exposure to responders, and to meet resource objectives.

FW-FIRE-DC-02: Within the wildland-urban interface and around high value resources, surface fuel loading and crown spacing provide conditions for low severity surface fire that minimizes threats to values.

FW-FIRE-DC-03: Treated fuel management areas (management actions or wildfire) allow opportunities over time for natural fire occurrence and provide fuel conditions that benefit fire management operations.

Goals

FW-FIRE-GO-02: The HLC NF works with adjacent communities, landowners, permittees and state, local, and other federal agencies to promote a collective understanding about wildfire risk and that wildland fire is an ecological process.

FW-FIRE-GO-03: The HLC NF works with the state and other partners as needed when designing fuels reduction projects to identify areas and resources of value for fuel treatments.

Objectives

FW-FIRE-OBJ-01: Hazardous fuels treatments occur on a minimum of 15,000 acres per decade within the wildland urban interface. Use any available wildland fire management opportunity to reduce fire intensity and severity. Treatment includes initial entry and maintenance to ensure desired fuel conditions are achieved. Achieving this would also contribute to FW-VEGT-OBJ-01.

Guidelines

FW-FIRE-GDL-01: To create (and/or minimize threats to) resilient, healthy ecosystems, vegetation treatment projects should allow opportunities for naturally ignited wildfire to occur and provide fuel conditions that benefit fire management operations.

FW-FIRE-GDL-02: To create (and/or minimize threats to) resilient, healthy ecosystems, wildland fire management strategies should promote desired vegetation conditions where wildfires result in fire severities that are “self-regulating” and reduce future risk.

FW-FIRE-GDL-03: To ensure shared stewardship when wildfires affect identified areas of tribal importance, the FS should communicate and collaborate with tribal leadership during fire incident management to identify and, to the extent practical, protect tribal values and minimize impacts to resources or areas of tribal importance.

All Terrestrial Vegetation (VEGT)

Desired Conditions

FW-VEGT-DC-01: Vegetation occurs across the landscape in a diverse pattern of compositions and structures within the natural range of variation that are resilient to future climates and disturbances such as fire, insects, disease, invasive species, floods, and droughts. Conditions are such that effective recovery

of vegetation is possible following disturbances. These conditions are described in **Error! Reference source not found.** and further quantified under desired conditions in the VEGF and VEGNF sections.

Table 4. Forestwide terrestrial vegetation desired conditions by broad potential vegetation types

Broad potential vegetation type	Terrestrial vegetation desired conditions
Warm dry	Forest resilience is achieved by emphasizing fire adapted species and structures. An increase in the extent and dominance of ponderosa pine, limber pine, and aspen occurs relative to the existing condition, while Douglas-fir decreases (but remains common). Rocky mountain juniper occurs but its abundance is limited on historically nonforested areas. Other species such as Engelmann spruce and lodgepole pine may thrive where moisture is less limiting. The quantity and extent of large and very large trees increases relative to the existing condition. Savannas occur on the driest sites, and some sites may be maintained in a nonforested condition by frequent disturbance or restoration. Seedling/sapling and small forest size classes occur but are limited, because large tree remnants are retained as is characteristic of a high frequency, low intensity disturbance regime. Stands in the large and very large tree size classes are often open or clumpy, with the large tree component comprised of long-lived fire-resistant species (ponderosa pine and Douglas-fir). Complex landscape patterns of size class and density occur, with open, uneven-aged forests and high within-stand variability common. Forests with low to medium density increase relative to the existing condition, while forests with high density decrease. Stands with higher densities occur on more mesic sites and are interspersed with open forests and meadows. Early successional forest patches are relatively small. Plant understories include rough fescue, Idaho fescue, bluebunch wheatgrass, sagebrush, common juniper, and bitterbrush on the driest sites and Oregon grape, snowberry, pinegrass, kinnickinnick, white spiraea, heartleaf arnica, elk sedge, and ninebark on more mesic sites. Snags are scattered as individuals or small groups. Coarse woody debris is fairly low.
Cool moist	Forest resilience is achieved through diversity of species and age/size class. The extent and dominance of aspen, Engelmann spruce, and whitebark pine increase relative to the existing condition, with lodgepole pine and Douglas-fir remaining abundant and subalpine fir also common. Minor amounts of ponderosa pine may also occur, on the warmest/driest sites. The spruce/fir cover type includes dense, multistoried stands that provide high quality multistory lynx habitat. Small size classes are common due to preponderance of lodgepole pine; but a decrease in the small size class with increases in large and very large classes still occurs relative to the existing condition. There is wide variability in size class because of the high severity, low frequency disturbance regime. Most especially, high diversity in size class occurs in lodgepole pine to ensure insect and fire disturbances occur at a scope and scale within their natural range of variation. The amount of low/medium and medium/high density classes increase while the high-density class decreases relative to the existing condition primarily in lodgepole pine and Douglas-fir forests. Large and very large trees, primarily Douglas-fir, are clumpy but scattered across the landscape to provide seed. Single-storied and single-aged conditions are common in lodgepole pine. Early successional forest patches tend to be fairly large. Understory plant species present may include twinflower, beargrass, huckleberry, grouse whortleberry, pinegrass, heartleaf arnica, elk sedge, and western meadowrue. Other species such as menziesia and alder may be found on the wettest sites. Snags occur in pulses and in clumpy distribution. Coarse woody debris levels vary widely.

Broad potential vegetation type	Terrestrial vegetation desired conditions
Cold	Forest resilience is achieved by emphasizing the presence of whitebark pine where possible. Increases in whitebark pine occur relative to the existing condition, focusing on open ridges and harsher aspects. On these sites, there is a decrease in subalpine fir and Engelmann spruce relative to the existing condition. Subalpine fir and Engelmann spruce remain common and dominate northerly and easterly aspects, swales, moist basins, and riparian areas. Lodgepole pine is present as well, on warmer sites. The abundance of the small forest size class is decreased relative to the existing condition, with an increase in the large size class. Whitebark pine is maintained across its natural range to the degree possible within the context of climate changes and increasing disturbance, with large trees present that are tolerant of moderate or low severity fires. Large subalpine fir and Engelmann spruce are also promoted on productive sites. The proportion of forests in the low/medium density class is increased with decreases in the high cover class relative to the existing condition, focusing on restoration of resilient, open multi-aged whitebark pine forests where dense multistoried spruce/fir or single-storied lodgepole pine dominate. Natural patch sizes reflect a mixed fire regime. Understory plant species present, such as grouse whortleberry and beargrass, may be sparse at the highest elevations where alpine vegetation is interspersed with bare ground and rock. Snags occur in pulses. Coarse woody debris levels vary widely.
Xeric grass-land	Xeric grassland plant communities are dominated by native species, and have high diversity of tall and medium height, cool and warm season grasses (for example, bluebunch wheatgrass, western needlegrass, needle-and-thread, blue grama), and short grasses (for example, Sandberg bluegrass, pine junegrass). Sub-shrubs and shrubs are present at less than 10% canopy cover. There is a variety of native forbs in varying amounts. The diversity of native plant species present allows for drought tolerance. Individual species can vary greatly in the amount of production depending on growing conditions. Vegetation typically has strong and robust root systems that allow production to increase considerably with favorable growing conditions. This plant community provides for soil stability and a properly functioning hydrologic cycle. Plant litter is a common component and is available for soil building and moisture retention. Plant litter is properly distributed with very little movement off-site, with natural plant mortality typically being low. Bare ground is present because of the warm dry nature of these sites but at low amounts. Encroachment by conifers and juniper is limited, since these grasslands are either maintained by a natural high frequency low severity fire regime, or are maintained by site conditions (i.e., they do not require fire to maintain the grassland vegetation). These vegetation types are generally tolerant of fire when fire frequency is in the range of 5 -15 years, although recovery is dependent on fire intensity and species. Maintenance of grasslands is dependent, in part, on periodic fires to remove residual litter and encroaching shrubs and trees, which may increase the burn intensity and possibly damage the dominant grassland species. Microphytic crust is maintained as a key feature.
Mesic grass-land	Mesic grassland communities are dominated by native species, and have greater amounts of mesic forbs, denser cover, and more species richness than xeric grasslands. The functional plant groups are characterized by long lived, moderately deep-rooted cool grass species (for example, rough fescue, Idaho fescue, timber oatgrass, upland sedges, tufted hairgrass, etc.) with a wide variety of mesic forbs present in varying amounts. Shrubs may be present with minor cover. Introduced species are rare. Bare ground is typically low (less than 3%) across most sites with litter being a common component and available for soil building and moisture retention. Plant litter movement is expected to be limited with plant litter being properly distributed and rarely moving off-site. These vegetation types are generally tolerant of moderate intensity wildfire. Common dominant grasses, such as rough fescue and Idaho fescue, may be topkilled, but the root crowns and associated growing points are protected and they respond favorably with vigorous regrowth. Within just a few years these species usually recover to pre-fire levels. Frequent burning maintains diversity in these vegetation types. Microphytic crust is maintained as a key feature.

Broad potential vegetation type	Terrestrial vegetation desired conditions
Xeric shrubland /woodland	Xeric shrubland plant communities support shrub species such as Wyoming big sagebrush, basin big sagebrush, rabbitbrush, horsebrush, broom snakeweed, low sagebrush and black sagebrush. Overstory species vary by location and site type. For example, low sagebrush tends to occupy the lower, drier and hotter sites with shallow soils whereas basin big sagebrush typically dominates sites with deeper soils and more plant available moisture. The understory is typically dominated by graminoid species such as needle-and-thread, Sandberg bluegrass and bluebunch wheatgrass. Canopy cover varies depending on the site and growing conditions but is typically low to moderate. Bare ground is present in higher amounts relative to mesic shrubland sites. Xeric woodlands are typically hot and dry or are steep, with shallow, skeletal soil. The dominant overstory species varies but includes Rocky Mountain juniper and mountain mahogany. Mountain mahogany is restricted to steep rocky soils and rock outcrops. Encroachment by conifers is limited, as it is maintained by a natural high frequency low severity fire regime. While sagebrush and mountain mahogany are often killed by fire, nonlethal or mixed severity fires that burn in a mosaic pattern leave live individuals and promote age class diversity while promoting the sprouting of other shrub (e.g. rabbitbrush, horsebrush) and grass species. The natural fire regime of this vegetation type maintains a patchy distribution of shrubs, so the general aspect of the vegetation is shrub-steppe grassland. Periodic low intensity burns can reduce sagebrush cover and increase herbaceous abundance of herbaceous species, creating a mosaic of burned and unburned patches. Microphytic crust is maintained.
Mesic shrubland	Mesic shrubland plant communities are generally more moist and productive than xeric sites. Shrub species such as mountain big sagebrush and mesic deciduous shrubs (for example, bitterbrush, snowberry, ninebark, serviceberry) are the dominant over story species with grass species (such as rough fescue, Idaho fescue, mountain brome) and various mesic forbs (for example, cinquefoil, prairie smoke) typically dominating the understory. Canopy cover varies depending on the site and growing conditions (for example, temperature, timing and amount of precipitation), but is typically moderate to high, and may result in lower cover of understory species. Encroachment by conifers is limited. Most shrub species respond well to light and mixed severity fire. With the exception of mountain big sagebrush, most of the mesic shrub species are vigorous root crown sprouters and respond favorably to fire, typically sprouting immediately following fire. However, extremely hot and intense fires that occur during summer months can cause damage to these shrublands and seed banks. Periodic burns can maintain this system. Microphytic crust is maintained as a key feature.
Riparian/ wetland	Riparian systems are comprised of a mosaic of communities dominated by species which tolerate and are adapted to periodic flooding and an associated seasonally high water table. Deciduous trees, particularly cottonwood, may be present along with riparian shrubs and herbaceous species. In wide valley bottoms, the vegetation typically is a mosaic of all lifeforms with patterns reflecting the meander patterns of the stream/river. Black cottonwood is the dominant tree species although other tree species may include aspen, narrowleaf cottonwood, Engelmann spruce and subalpine fir; on drier sites, Douglas fir and Rocky Mountain juniper may be present with low cover and scattered distribution. Dominant shrubs may include mountain alder, various species of willows, river birch, dogwood, hawthorn, chokecherry, rose, silver buffaloberry, Rocky Mountain maple and/or snowberry, among others. A wide variety of herbaceous species, including, grasses, sedges, rushes, spikerushes, bulrushes and forbs, are present in the understory in varying amounts. Wetlands are characterized by dominant vegetation adapted to saturated (anaerobic) soil conditions. The vegetation complex is usually represented by a mosaic of herbaceous and woody plant communities that armor streambanks and create floodplain roughness, slowing flows and facilitating bank and floodplain development. Low willow species (e.g., wolf willow), bog birch and bog blueberry are typically present in subalpine wetlands. Herbaceous species may be dominated by sedges, rushes, spikerushes cattails, and/or bulrushes. Bryophytes, including sphagnum, are often well represented in fens. Also see forestwide components for RMZs. Rare species, such as sundew, may also be present in peatlands. Typically, with the exception of conifers, species in riparian/wetland systems respond favorably to fire. The growing points of the vegetation are usually protected in the moist to saturated soil. Regrowth typically occurs within the same growing season. Microphytic crust is maintained.

Broad potential vegetation type	Terrestrial vegetation desired conditions
Alpine	Alpine ecosystems occupy harsh high elevation sites, resulting in short stature and relatively slow growth for both shrubs and herbaceous species. Wetland communities are present in snowloaded depressions, and support various willow species (e.g., planeleaf willow), along with wetland herbaceous species (e.g., tufted hairgrass, marsh marigold). Alpine ecosystems are mostly treeless, although some conifers (e.g., subalpine fir, whitebark pine) may be present with minor cover as krummholtz patches. Vegetation cover is typically low to moderate, depending on site characteristics. The plant communities are dominated by a number of shrubs, forbs and graminoids including: arctic willow (turf community), mountain avens, (cushion plant community), mountain heather and moss-heather (snow bed communities). Many of these areas experience only patchy fire due to the low amounts and patchiness of fuels. The fire return interval is typically very long (500 years or greater) in alpine ecosystems. Historically, stand-replacing fires occur infrequently in adjacent associated subalpine woodlands. Fire severity and spread is usually variable due to the short duration without snow cover. In addition, limited fuel loading and rock scree fields preclude fires from spreading if lightning strikes do occur. Microphytic crust is maintained as a key feature.

FW-VEGT-DC-02: The plan area supports a distribution of cover types shown in Table 5. Nonforested cover types can occur on forested broad potential vegetation types and be perpetuated by natural disturbances or restoration activities.

Table 5. Forestwide existing and desired conditions for cover types (percent of area)

Cover Type[1]	Forestwide		Warm dry, Region 1 broad potential vegetation type		Cool moist, Region 1 broad potential vegetation type		Cold, Region 1 broad potential vegetation type	
	Existing[3]	Desired	Existing[3]	Desired	Existing[3]	Desired	Existing[3]	Desired
Nonforested[2]	14 (11-16)	15-25	13 (10-17)	5-20	10 (6-14)	5-10	11 (7-16)	1-10
Aspen/hardwood	1 (0.4-2)	2-5	1 (0.3-2)	2-5	2 (0.2-3)	2-5	Trace	Trace
Ponderosa pine	8 (6-10)	15-25	16 (12-20)	40-60	2 (0.6-4)	1-5	Trace	Trace
Douglas-fir	29 (25-35)	15-25	52 (42-61)	30-40	23 (17-28)	5-15	5 (2-8)	2-5
Lodgepole pine	27 (24-30)	15-25	16 (12-21)	2-7	35 (29-42)	25-35	37 (29-44)	40-50
Spruce/Fir	12 (10-15)	10-20	Trace	Trace	19 (14-24)	35-45	27 (21-34)	40-45
Whitebark pine	4 (2-5)	2-5	Trace	Trace	2 (0.6-4)	2-5	12 (7-16)	10-20

1 Cover types are broad groups of vegetation based on the dominant species. A cover type often contains multiple species (see appendix D for a more detailed description).
2 Nonforested areas include grass and shrub cover types, which may support widely scattered trees in some cases.
3 Existing condition shown is the mean percent of the area with the 90% confidence interval in parenthesis. Source is R1 Summary Database, FIA data. Existing condition represents 2018 conditions. Estimates are rounded to the nearest whole number unless the value is less than 1%, in which case it is rounded to the nearest 10th. The totals do not necessarily equal 100% due to non-vegetated areas (water or rock).

FW-VEGT-DC-03: Vegetation conditions provide habitat requirements to support populations of species of conservation concern, threatened or endangered species, and other native and desired non-native species based upon the inherent capability of lands.

FW-VEGT-DC-04: Vegetation patterns provide connectivity and allow for potential genetic interchange to occur to support ecosystem functions, including potential species range shifts that may occur in response to climate change.

Objectives

FW-VEGT-OBJ-01: Vegetation management occurs on at least 130,000 acres per decade to maintain, restore, or move vegetation towards desired conditions. Control of invasive species and livestock grazing also may contribute to the achievement of desired conditions; these activities are addressed in the Invasive Plants and Livestock Grazing sections. Also see FW-FIRE-OBJ-01. Treatments to achieve this objective may occur on forested or nonforested vegetation communities and include, but are not limited to, the following activities:

- Planned or unplanned fire ignitions
- Fuel reduction treatments such as thinning, piling, chipping, and mastication
- Removal of encroaching trees in nonforested ecosystems
- Timber harvest
- Tree planting and revegetation of native plants
- Noncommercial thinning of forests

Guidelines

FW-VEGT-GDL-01: Removal of native vegetation during nonvegetation management activities (for example, road maintenance) should be limited to the extent needed to achieve the project purpose and need.

FW-VEGT-GDL-02: Livestock grazing practices should be modified as necessary to ensure that revegetation and/or reforestation is successful after management activities or natural disturbances, as defined in site-specific prescriptions.

FW-VEGT-GDL-03: To maintain the diversity of native tree species, when artificial reforestation is prescribed locally, adapted tree stock should be used unless nonlocal stock is deemed appropriate based on an assisted migration strategy.

FW-VEGT-GDL-04: To ensure the re-establishment of desirable vegetation and limit the spread of invasive plants following management activities which disturb or expose soil, reseeding with native plants should occur promptly. Seeding should occur during optimal seeding windows for germination and survival and should utilize blue-tag certified seed and weed-free native seed. Seed mixes should be approved by a botanist. Genetically appropriate native plant materials should be given primary consideration during revegetation. Techniques which promote establishment of native species should be incorporated into revegetation planning. Nonnative plant species may only be used when consistent with national policy and direction.

Forested Vegetation (VEGF)

Desired Conditions

FW-VEGF-DC-01: The plan area supports a distribution of individual tree species as described in Table 6. This distribution supports the natural species diversity across the landscape and allows for recruitment following disturbances.

Table 6. Forestwide existing and desired conditions for tree species presence (percent of area[1])

Tree species	Forestwide[3]		Warm dry, Region 1 broad potential vegetation type		Cool moist, Region 1 broad potential vegetation type		Cold, Region 1 broad potential vegetation type	
	Existing[2]	Desired	Existing[2]	Desired	Existing[2]	Desired	Existing[2]	Desired
limber pine	11 (9-13)	10-15	16 (12-20)	15-25	9 (6-13)	5-15	5 (2-9)	5-15
Rocky Mountain juniper	5 (4-7)	2-5	12 (9-15)	5-15	1 (1-2)	0-5	0.2 (0.2-1)	0-5
ponderosa pine	7 (5-9)	15-25	17 (13-21)	55-65	0.4 (0.4-1)	1-10	Trace	Trace
Douglas-fir	46 (43-50)	35-45	70 (65-75)	65-75	43 (37-49)	25-35	15 (9-20)	10-20
Aspen and cottonwood	2 (1-3)	2-5	2 (1-4)	5-10	3 (1-5)	2-10	Trace	Trace
Engelmann spruce	23 (20-26)	15-25	5 (3-7)	1-5	42 (36-49)	30-40	32 (25-39)	30-40
lodgepole pine	38 (35-42)	20-30	24 (19-29)	5-15	52 (46-58)	30-40	51 (43-59)	45-55
subalpine fir	27 (24-31)	15-25	Trace	Trace	46 (39-52)	45-55	54 (47-61)	40-50
whitebark pine	11 (9-14)	10-20	Trace	Trace	10 (6-14)	5-15	31 (24-38)	35-45

1 Percent of area where at least one tree of the species is present.
2 Total may be greater 100% because more than 1 species can be present on a site. Existing condition shown is the mean percent of the area with the 90% confidence interval (see glossary) shown in parenthesis. Source is R1 Summary Database, FIA data.
3 Forestwide distributions include trees that occur on nonforested potential vegetation type.

FW-VEGF-DC-02: The plan area supports a natural diversity of forest size classes as shown in Table 7, which represents the diversity of successional stages across the landscape. The location and precise abundance of size classes fluctuate over time as forests develop, are influenced by disturbances, and may be limited by site productivity and species composition.

Table 7. Forestwide existing and desired conditions of size class (percent of area[2])

Forest size class[1]	Forestwide		Warm dry, Region 1 broad potential vegetation type		Cool Moist, Region 1 broad potential vegetation type		Cold, Region 1 broad potential vegetation type	
	Existing[3]	Desired	Existing[3]	Desired	Existing[3]	Desired	Existing[3]	Desired
Seedling/sapling (0-4.9")	13 (10-17)	1-15	11 (7-15)	1-10	12 (7-18)	1-20	22 (14-30)	1-35
Small (5-9.9")	39 (36-42)	5-20	36 (31-41)	1-10	42 (36-48)	5-30	44 (37-51)	5-40
Medium (10-14.9")	21 (19-24)	5-20	25 (21-29)	1-10	24 (20-29)	5-35	14 (9-18)	5-45
Large (15.0-19.9")	5 (4-7)	20-30	9 (6-12)	20-40	4 (2-7)	20-30	1 (0.1-3)	25-40
Very large (20"+)	2 (0.8-3)	5-25	4 (2-6)	15-40	0.2 (0.2-0.7)	10-25	0.2 (0.2-1)	1-5

1 Size class = the average diameter class of live trees based on basal area weighted diameter, shown as ranges of diameter at breast height, or 4.5' above ground level. A stand within a size class may contain trees smaller and/or larger than the class range.
2 Total may less than 100% because nonforested areas (grass, shrub, savanna) are excluded.
3 Existing condition shown is the mean percent of the area with the 90% confidence interval (see glossary) shown in parenthesis. Source is R1 Summary Database, FIA data.

FW-VEGF-DC-03: The plan area supports a natural diversity of forest density classes as shown in Table 8. A wide range of densities and associated vertical structures (canopy layers) occur, contributing to resiliency, wildlife habitat, and timber productivity.

Table 8. Forestwide existing and desired conditions of density class (percent of area)

Forest density class[1]	Forestwide		Warm dry, Region 1 broad potential vegetation ype		Cool Moist, Region 1 broad potential vegetation type		Cold, Region 1 broad potential vegetation type	
	Existing[2]	Desired	Existing[2]	Desired	Existing[2]	Desired	Existing[2]	Desired
Low/med (< 39.9)	26	25-50	26	25-55	22	20-40	14	20-50
Med/high (40-59.9)	27	30-50	29	20-45	20	30-50	21	45-65
High (60+)	48	10-35	45	10-50	58	15-40	65	5-25

1 Density class = the average canopy cover of live trees, shown as ranges of canopy cover percent.
2 Existing condition is from the SIMPPLLE input landbase, based on VMap imagery.

FW-VEGF-DC-04: Forest conditions support an increasing trend in the distribution of large-tree structure as shown in Table 9 to provide ecosystem functions such as structural diversity, seed sources for post-disturbance resilience, and wildlife habitat.

Table 9. Forestwide existing and desired conditions of large-tree structure (percent of area)

Large-tree structure[1]	Forestwide		Warm dry, Region 1 broad potential vegetation type		Cool moist, Region 1 broad potential vegetation type		Cold, Region 1 broad potential vegetation type	
	Existing[2]	Desired	Existing[2]	Desired	Existing[2]	Desired	Existing[2]	Desired
Large (>15" d.b.h.)	14 (12-16)	35-50	16 (13-19)	35-65	16 (12-20)	35-45	9 (6-13)	40-70
Very large (>20" + d.b.h.)	7 (6-9)	10-35	13 (9-16)	20-60	5 (3-7)	15-35	2 (0.5-3)	2-10

1Large-tree structure depicts where minimum numbers of large trees are found and can occur in any size class. The minimum tree criteria for large tree structure are described in the glossary and appendix D.
2 Existing condition shown is the mean percent of the area with the 90% confidence interval (see glossary) shown in parenthesis. Source is R1 Summary Database, FIA data.

FW-VEGF-DC-05: Forest conditions support an abundance and distribution of old growth that is dynamic over time. All vegetation desired conditions help ensure that an appropriate array of conditions are present to provide old growth. The amount of old growth is similar to or greater than that of the 2018 condition. The desired condition of old growth is further described in Table 10.

Table 10. Forestwide existing and desired conditions of old growth[1]

Region 1 broad potential vegetation types[2]	Existing condition[3]	Desired condition
Forestwide	11% (9-13)	Old growth is distributed widely across the forest and in every GA, and levels vary depending on available compositions and structures, disturbance levels, and management objectives. Old growth may be subject to wider pulses of availability than in the past due to the likelihood of increased extent and/or severity of wildfire disturbances. Old growth distribution that complements habitat connectivity is desired. Old growth contains components that contribute to high quality habitat, including large and/or very large live trees with rot or broken tops, snags, downed woody material, and a diversity of tree size classes and canopy layers. A variety of old growth types are present, representing the natural species diversity of the HLC NF.
Warm dry	8% (6-11)	Old growth is dominated by ponderosa pine, Douglas-fir, and/or limber pine, often in large patches with an uneven-aged and irregular tree distribution. Ponderosa pine-dominated old growth is particularly desirable, because it is currently rare. Stands are resilient to low severity disturbance. Other old growth types such as spruce/fir occur in riparian areas. Species such as juniper and aspen are valuable habitat components.
Cool moist	14% (10-19)	Old growth is subject to wider pulses of availability relative to the other potential vegetation types, due to the higher severity disturbance regimes in this type. Old growth includes spruce/fir or Douglas-fir dominated stands, often with dense canopy layers, as well as lodgepole pine. Landscape-level resiliency is provided by a mosaic of younger forests that grow to replace old growth when it is killed by stand-replacing events.
Cold	15% (11-20)	Old growth generally consists of whitebark pine, Engelmann spruce, and/or subalpine fir. Stand-level resiliency and open structures is desired in whitebark pine types versus spruce/fir types which may be more dense and layered.

1 See glossary and appendix D for definitions of old growth.
2 Region 1 broad forested potential vegetation type. Also see appendix D.

3 Existing condition is the mean percent of old growth with the 90% confidence interval (see glossary) shown in parenthesis. Source is R1 Summary Database, FIA data.

FW-VEGF-DC-06: Forest conditions support natural quantities and distributions of snags. Snags are unevenly distributed and dynamic over time, with a range of decay classes represented. The highest densities of snags occur in burned areas and in areas infested by insects; the lowest densities occur along roads, in areas where the concern for human safety is elevated, and in stands where active management is occurring. Individual stands may have no snags, or many, depending upon site-specific conditions. Table 11 displays the desired minimum number of snags per acre by size class and snag analysis group.

Table 11. Forestwide existing condition and desired minimum snags per acre

Snag analysis group[1]	Medium (>10" d.b.h[4])		Large (>15" d.b.h.[4])		Very large (>20" d.b.h.[4])	
	Existing condition[2]	Desired minimum[3]	Existing condition[2]	Desired minimum[3]	Existing condition[2]	Desired minimum[3]
Lodgepole pine	12 (9-15)	12.9	1 (1-2)	2.0	0.1 (0-0.3)	0.2
Warm dry	7 (5-9)	4.3	2 (1-3)	1.1	1 (0.4-1)	0.2
Cool moist	15 (11-19)	12.3	3 (2-5)	2.4	1 (0.3-2)	0.4
Cold	17 (12-24)	13.4	4 (2-6)	2.3	1 (0.2-2)	0.9

1 Snag analysis groups are from Bollenbacher (2008). See appendix D.
2 Existing condition is the mean snags per acre, with the 90% confidence intervals shown in parenthesis. Source is R1 Summary Database, FIA data, Hybrid 2011.
3 Desired is derived from Bollenbacher (2008) supplemental data tables (2017), where the natural range is represented by the mean of snags found in wilderness and roadless areas on the HLC NF measured on periodic forest inventory and analysis plots.
4 Diameter at breast height (4.5' above the ground). The classes are not mutually exclusive; e.g. the numbers for the 10"+ medium class include the large/very large classes and the 15"+ large class includes the very large class.

Table 12 displays the desired minimum distribution of snags, in terms of the percent area of the snag analysis group that contains at least 1 snag of the indicated size class.

Table 12. Forestwide existing condition and desired minimum snag distribution (percent of area)

Snag analysis group[1]	Medium (>10" d.b.h[4])		Large (>15" d.b.h.[4])		Very large (>20" d.b.h.[4])	
	Existing condition[2]	Desired condition[3]	Existing condition[2]	Desired condition[3]	Existing condition[2]	Desired condition[3]
Lodgepole pine	22 (18-27)	15	4 (2-7)	5	0 (0.4-1)	2
Warm dry	17 (13-21)	8	7 (5-10)	4	4 (2-5)	2
Cool moist	31 (24-38)	20	9 (5-14)	10	3 (1-5)	3
Cold	30 (22-38)	20	11 (6-17)	10	3 (1-7)	5

1, 2, 3, 4 Refer to the foot notes for Table 11.

FW-VEGF-DC-07: Coarse woody debris (downed wood greater than or equal to 3 inches diameter) is present across forested vegetation communities in quantities consistent with the natural range of variation as shown in Table 13 to provide wildlife habitat, long-term nutrient cycling, and other ecosystem functions.

Table 13. Forestwide desired and existing tons/acre of coarse woody debris

Region 1 broad potential vegetation type	Existing[1]	Average desired[2]	Appropriate distribution
Warm dry	3.38 (2.66-4.19)	3-20	Coarse woody debris is variable in amount, size, species and stages of decay across space and time, emphasizing pieces 10" in diameter and 10' in length or greater, which are higher value for wildlife. Individual stands may have little or no coarse woody debris, or a higher amount. Very minimal or no coarse woody debris occurs in nonforested potential vegetation types. It may be appropriate for 30 to 50 percent of a forested potential vegetation type area to have little to no coarse woody debris at a given time. Amounts below the desired average are found on hot dry sites, in developed recreation areas, and where the concern for fire impacts to values at risk is elevated. Higher amounts may be found on moist sites and riparian areas, areas with low direct human influence, areas that have burned, and those with insect/disease infestations. Pulses of coarse woody debris occur following disturbances. Downed wood in pine-dominated forests may be expected to increase during the first decade of the Plan due to a mountain pine beetle outbreak.
Cool moist	7.22 (5.81-8.76)	10-30	
Cold	7.04 (5.33-8.91)	10-30	

1 Existing condition shown is the mean tons per acre with the 90% confidence interval (see glossary) shown in parenthesis. Source is R1 Summary Database, FIA data.
2 Desired tons/acre is derived from Brown et al 2003 and the tons/acre found in wilderness and roadless areas on the HLC NF, R1 Summary Database, FIA data.

FW-VEGF-DC-08: Forest patches of different compositional and structural conditions form a landscape pattern that contributes to resilience and habitat connectivity. Early successional forest patches provide edge habitat and functional openings that contrast sharply with adjacent forests. Patches of different size classes vary in extent, and are generally bounded by ridges, streams, and other topographic or biophysical features. Landscape and within-patch patterns reflect nautral fire regimes to the extent possible given changing climate conditions.

- In the warm dry broad potential vegetation type, forest patches are indicative of low severity underburns as well as mixed severity and occasional stand replacing events. Early successional forest patches tend to be smaller than the other potential vegetation types, due to the more frequent disturbance regimes which tend to cause a complex mosaic of within-stand structures and small gap openings with mature tree remnants as opposed to patches dominated by seedlings.
- In the cool moist and cold potential vegetation types, patches reflect more mixed severity and stand replacing disturbance regimes. Early successional forest patches in these potential vegetation types tend to be larger than in the warm dry potential vegetation type, due to high severity disturbances.

FW-VEGF-DC-09: Forest composition, structure, and pattern allow for native forest insect and diseases to occur across their native extent and affect vegetation at a scope and scale consistent with their natural endemic role. Forests impacted by insects and disease provide structural features including snags, downed wood, and decaying live trees.

Guidelines

FW-VEGF-GDL-01: Vegetation management projects should be designed to retain at least the minimum number of large live trees listed below to provide future seed, structural diversity, wildlife habitat, future

snags and downed wood. This guideline applies as an average across all treatment units in a project. Large live trees need not be present on every acre or in every treatment unit.

- Lodgepole pine snag analysis group: 1 tree >15" dbh per 10 acres
- Warm dry snag analysis group: 2 trees >15" dbh per 10 acres
- Cool moist snag analysis group: 9 trees >15" dbh per 10 acres
- Cold snag analysis group: 3 trees >15 per 10 acres

If the minimum number of large trees are not present, leave all that are available. Trees preferred for retention are the longest lived, healthiest, windfirm, most fire adapted species. Exceptions may occur when there are fewer than the minimum desirable trees available due to insects, disease, lack of wind firmness, or unavoidable operational limitations. Large trees may also function as replacement snags, and/or be mixed in clumps with snags, to meet FW-VEGF-GDL-02. Exceptions may occur where there are issues of human safety, especially in designated campgrounds and developed recreation sites, permitted ski areas, and utility lines. See FW-RSUP-DC-05, LB-SHOWSKI-DC-02, and RM-TETONSKI-DC-02.

FW-VEGF-GDL-02: When conducting timber harvest or other activities that involve mechanically cutting trees over 10" diameter, projects should retain the following minimum snags per acre[1] ≥ 10" diameter averaged across the snag analysis groups[2] in the project area to provide snag habitat at the project level.

- Across the warm dry snag analysis group, retain an average of at least 2 snags/acre[3].
- Across all other snag analysis groups, retain an average of at least 8 snags/acre[3].

Snags retained on the landscape should include a variety of size classes and species available. Preference should be given to the largest snags available, with snags >20" diameter being highest priority. Snag species preference from highest to lowest is ponderosa pine, western larch, whitebark pine, limber pine, Douglas-fir, hardwoods (aspen or cottonwood), Engelmann spruce, subalpine fir, lodgepole pine. Snags should be 300' or farther from a road that is open to firewood cutters when possible. Snags should be distributed in a clumpy manner; they need not be present on every acre. If fewer than the minimum required snags are present outside of treatment units, or the number of snags outside of treatment units is unknown, retain snags if available where it is safe and operationally feasible to do so within treatment units to achieve the project area averages; or to achieve the average across treatment units, whichever is less. Snags that are created by activities such as prescribed burning may be counted toward the desired averages. If fewer than the minimum snags are present across the project area and in treatment units, retain those that are available as well as live snag replacements to achieve the desired numbers, averaged across treatment units. When selecting snag replacement trees, retain the largest and most decadent trees; those with rot or wildlife use are preferred. Replacement snags may be used to meet FW-VEGF-GDL-01. In the event that snags intended for retention are cut or toppled by fire, they should be left onsite as woody debris.

Snag retention does not apply where there are issues of human safety in designated campgrounds and developed recreation sites, permitted ski areas, utility lines, prescribed burn control lines, and immediately adjacent to open roadways or private infrastructures. See FW-RSUP-DC-05, LB-SHOWSKI-DC-02, and RM-TETONSKI-DC-02.

1 Snags per acre is the average of snags per acre across the entire snag analysis group within the project area.
2 See appendix D.
3 The minimum numbers to leave are based on the lower bound of the 90% confidence interval of the mean desired snags per acre displayed in FW-VEGF-DC-08.

FW-VEGF-GDL-04: To promote the retention of old growth (see glossary) and contribute to biodiversity, vegetation management activities in old growth stands should only occur for one or both of the following purposes. Management activities conducted for these purposes should retain all minimum quantitative old growth characteristics as well as qualitative attributes to the extent possible.

- Maintain or restore old growth habitat characteristics and ecosystem processes.
- Increase resistance and resilience to disturbances or stressors that may have negative impacts on old growth characteristics or abundance (such as drought, wildfire, and bark beetles).

Exceptions to this guideline are allowed for the following purposes:

- Where needed to mitigate imminent hazards to: (1) public safety in campgrounds, other designated recreation sites, administrative sites, and permitted special use areas; or (2) infrastructure that is essential to community welfare (e.g., utilities, communications, and where fire modeling shows a risk to evacuation routes).
- Where project analysis has identified a need to remove a proportion of lodgepole pine old growth to achieve a diversity of age classes.

FW-VEGF-GDL-05: Vegetation management projects should retain at least the minimum amount of coarse woody debris (greater than or equal to 3" in diameter) displayed below, averaged for each treatment unit on forested sites, to provide for well-distributed coarse woody debris that contributes to nutrient cycling, structural diversity, and habitat. The requirement should be met immediately following completion of all project activities. Also see FW-SOIL-GDL-04.

- Warm dry R1 broad potential vegetation type: 5 tons/acre
- Cool moist and cold R1 broad potential vegetation types: 10 tons/acre

The guideline applies to any vegetation treatment in forested communities, including timber harvest and prescribed fire. This guideline does not apply in nonforested vegetation communities or in open forest savannas that may occur in the warm dry potential vegetation type. The guideline applies as an average across each vegetation treatment unit; the downed wood may be irregularly distributed. Downed wood should consist of intact pieces of a variety of species, sizes and stages of decay, depending on site conditions. Prescriptions should emphasize retaining larger debris (pieces 10" diameter and 10' in length or greater) where possible, which are higher value to wildlife.

Exceptions to the guideline may occur where there is elevated concern with fire risk (recreation sites, areas adjacent to infrastructure or private ownerships, wildland urban interface areas, utility lines, etc.), as supported by site-specific analysis.

Nonforested Vegetation (VEGNF)

Desired Conditions

FW-VEGNF-DC-01: Native plant communities support diverse age classes of shrubs and a vigorous, diverse, self-sustaining understory of grasses and forbs relative to site potential (based on ecological classification) and consistent with the natural range of variation.

FW-VEGNF-DC-02: Native plant species dominate and invasive plant species are at low abundance or non-existent. Naturalized non-native species (such as Kentucky bluegrass and timothy) may be present but do not increase in extent.

FW-VEGNF-DC-03: Nonforested vegetation dominates sites on dry forested potential vegetation types that were historically maintained without trees by frequent fire. This includes fire-maintained grass and shrublands where tree comprise 0-5% canopy cover as well as savannas characterized by a dominance of

grass or shrub understories with widely spaced fire-resilient trees at 5-10% canopy cover. In such areas, encroachment of conifer species is minimal.

Threatened, endangered, proposed and candidate plant species; and plant species of conservation concern (PLANT)

Desired Conditions

FW-PLANT-DC-01: Habitat conditions support the recovery and persistence of plant species that are recognized as threatened, endangered, proposed, or candidate under the Endangered Species Act, and those that are identified as species of conservation concern. Ecological conditions and processes that sustain the habitats currently or potentially occupied by these plant species are maintained or restored.

FW-PLANT-DC-02: Key whitebark pine areas such as cone collection sites, resistant seed-bearing trees, and seed orchards persist on the landscape.

Goals

FW-PLANT-GO-01: Recovery and long-term persistence of plants that are threatened, endangered, proposed, or candidate under the Endangered Species Act or species of conservation concern is supported by cooperation with other agencies and landowners to expand inventories, identify potential habitat for these species, and promote protection and/or restoration of associated habitats.

Objectives

FW-PLANT-OBJ-01: Treat at least 4,500 acres over the life of the plan for the purpose of sustaining or restoring whitebark pine and contribute to achieving desired conditions as described in the forested vegetation section. Achieving this would also contribute to FW-VEGT-DC-01. Refer to appendix C for information on possible restoration strategies and activities.

Guidelines

FW-PLANT-GDL-01: Activities affecting vegetation in known occurrences or suspected habitat of plants listed as threatened, endangered, proposed, or candidate under the Endangered Species Act, and those that are identified as species of conservation concern should be designed to provide for their long-term persistence.

Wildlife (WL)

Desired Conditions

FW-WL-DC-01: Habitats for native wildlife species are available throughout those species' potential natural ranges on NFS lands. Habitats for desired nonnative wildlife species are available on NFS lands where they can be supported by healthy, functioning ecosystems, as described in the vegetation section.

FW-WL-DC-02: Vegetation composition, structure, and distribution, including live vegetation and such things as fire or insect-killed trees, provide the life/natural history requirements of native and desired nonnative wildlife species, for the portion of those species' life cycles that occur on NFS lands. Also see Vegetation section.

FW-WL-DC-03: Vegetation composition, structure, and distribution allow wildlife to move within and between NFS parcels in response to seasonal habitat needs, dispersal needs, disturbances (such as, fire, insect infestations), and long-term changes (such as climate change). Also see Vegetation section.

FW-WL-DC-04: Large, unroaded areas are distributed and connected forestwide, providing for species with large home ranges that also require seclusion or low level of disturbance by humans.

FW-WL-DC-05: Conflicts between humans and wildlife are rare.

FW-WL-DC-06: Key seasonal habitat where wildlife are sensitive to human disturbance, such as ungulate winter range, nest and den sites, and other birthing and rearing sites are relatively free of human disturbance during the period in which those species are active in these areas.

FW-WL-DC-09: In lynx habitat (see glossary), boreal forest and associated matrix habitat provide the mosaic of structural stages necessary (as defined by the best available scientific information) to support the denning, foraging, resting, and travel habitat needs of Canada lynx.

Goals

FW-WL-GO-01: Coordination with Montana Fish, Wildlife, and Parks and other agencies occurs during project planning, in order to allow consideration of the goals and objectives of these agencies regarding wildlife and wildlife habitats.

FW-WL-GO-02: Cooperative meetings among Forest Service and Montana Fish, Wildlife, and Parks biologists occur annually, in order to evaluate management direction for wildlife and habitats on NFS and adjoining lands, and to recommend potential adjustments to management for the purposes of maintaining or improving habitats.

FW-WL-GO-03: The FS works with community leaders, youth and schools, homeowners, businesses, private organizations, and other agencies to develop and disseminate information about how to live, work, and recreate where wildlife species are present. Also see Public Information, Interpretation and Education section (CONNECT).

FW-WL-GO-04: Linkage areas identified through interagency coordination facilitate the movement of wildlife between NFS parcels separated by other ownerships.

FW-WL-GO-05: Forest biologists and managers cooperate with other agencies and collaborate on conservation strategies, recovery plans and management of habitat, to achieve recovery of federally listed wildlife species occurring on NFS lands.

FW-WL-GO-06: Through cooperation with other agencies, collaboration on conservation strategies and other management plans, and management of habitat, the need for listing of additional wildlife species under the Endangered Species Act is prevented.

Northern Continental Divide Ecosystem Grizzly Bear Amendment (NCDE)

NCDE Forestwide Plan Components

Desired Conditions

FW-NCDE-DC-01: The risk of grizzly bear-human conflict is reduced by information, education, and design features or criteria for management activities. *NCDE-DC-WL-03*

FW-NCDE-DC-02: National forest system lands provide a variety of public services and special forest products (such as mushrooms, huckleberries, firewood) while minimizing the risk of grizzly bear-human conflicts on NFS lands in the NCDE. *NCDE-DC-SFP-01*

FW-NCDE-DC-03: Mineral materials are available based upon public interest, in-service needs, material availability, and valid existing rights, where consistent with desired conditions for other resources. *NCDE-DC-MIN-01*

Standards

FW-NCDE-STD-01: Grizzly bear habitat on NFS lands in the NCDE shall be delineated and managed as primary conservation area, zone 1, zone 2, or zone 3 (see figure 1-2 or subsequent USFWS updates if applicable). *NCDE-STD-WL-01*

FW-NCDE-STD-02: Special-use permits for apiaries (beehives) located on NFS lands shall incorporate measures including electric fencing to reduce the risk of grizzly bear-human conflicts, as specified in the food/wildlife attractant storage special order. *NCDE-STD-SFP-01*

NCDE PCAZ1Z2 Plan Components

Desired Conditions

PCAZ1Z2-NCDE-DC-01: Within the NCDE primary conservation area, zone 1, and zone 2, bear attractants on NFS lands are stored in a manner that reduces the risk of grizzly bear-human conflicts in the NCDE. *NCDE-DC-WL-01*

Standards

PCAZ1Z2-NCDE-STD-01: Within the NCDE primary conservation area, zone 1, and zone 2, food/wildlife attractant storage special order(s) shall apply to NFS lands. *NCDE-STD-WL-02*

Guidelines

PCAZ1Z2-NCDE-GDL-01: Within the NCDE primary conservation area, zone 1, and zone 2, contractors, permittees, lessees, operators, and their employees should be informed of food/wildlife attractant storage special order(s) and procedures for safely working and recreating in grizzly bear country, prior to turnout of livestock or beginning work and annually thereafter, in order to reduce the risk of grizzly bear-human conflicts. *NCDE-GDL-WL-01*

PCAZ1Z2-NCDE-GDL-02: Within the NCDE primary conservation area, zone 1, and zone 2, if a contractor, permittee, lessee, or operator or their employees elect to camp on NFS lands other than in a developed recreation site, the site should be evaluated and written authorization (i.e., a campsite agreement that includes the food/wildlife attractant storage special order) should be provided before the campsite is established. The purpose is to reduce the risk of grizzly bear-human conflicts. *NCDE-GDL-WL-02*

NCDE PCAZ1 Plan Components

Desired Conditions

PCAZ1-NCDE-DC-01: Within the NCDE primary conservation area and zone 1, grizzly bear habitat on NFS lands contributes to sustaining the recovery of the grizzly bear population in the NCDE and contributes to connectivity with neighboring grizzly bear recovery zones. *NCDE-DC-WL-02*

Standards

PCAZ1-NCDE-STD-01: Within the NCDE primary conservation area and zone 1, new or reauthorized livestock grazing permits and annual operating plans shall incorporate requirements to reduce the risk of grizzly bear-human conflicts (e.g., a food/wildlife attractant storage special order). New or reauthorized permits shall include a clause providing for modification, cancellation, suspension, or temporary cessation of activities, if needed, to resolve a grizzly bear-human conflict situation. NCDE-STD-GRZ-01

PCAZ1-NCDE-STD-02: Within the NCDE primary conservation area and zone 1, permits for livestock grazing shall include a provision that requires the reporting of livestock carcasses within 24 hours of discovery, which shall be followed by proper disposal of the carcass. Boneyards shall not be established on NFS lands. *NCDE-STD-GRZ-03*

PCAZ1-NCDE-STD-03: Within the NCDE primary conservation area and zone 1, there shall be no increase in the number of active sheep allotments or in permitted sheep animal unit months above the baseline (see glossary) on NFS lands. Allowable animal unit months shall not be increased for inactive allotments.

Note: Existing allotments may be combined or divided as long as doing so does not result in grazing allotments in currently unallotted lands or an increase in animal unit months. *NCDE-STD-GRZ-04*

PCAZ1-NCDE-STD-04: Within the NCDE primary conservation area and zone 1, temporary permits for grazing by small livestock for purposes such as controlling invasive plants, reducing fire risk, or trailing of small livestock across NFS lands shall not result in an increase in bear-small livestock conflicts. *NCDE-STD-GRZ-06*

PCAZ1-NCDE-STD-05: Within the NCDE primary conservation area and zone 1, mining activities (as authorized under the Mining Law of 1872) and oil and gas activities (as authorized under the Federal Onshore Oil and Gas Leasing Reform Act of 1987) occurring on NFS lands, where feasible shall avoid, minimize, and/or mitigate environmental impacts to grizzly bears or their habitat, subject to valid existing rights. Stipulations or mitigation measures already included in existing leases, permits, or plans of operation on NFS lands shall not be changed, nor will additional stipulations or mitigation measures be added, without the lease, permit, or plan of operation holder's agreement. *NCDE-STD-MIN-01*

PCAZ1-NCDE-STD-06: Within the NCDE primary conservation area and zone 1, new or reauthorized permits, leases, and/or plans of operation shall include a provision for modification or temporary cessation of activities if needed to resolve a grizzly bear-human conflict situation. *NCDE-STD-MIN-02*

PCAZ1-NCDE-STD-07: Within the NCDE primary conservation area and zone 1, new plans of operation, permits, and/or leases for mineral activities shall include measures to reasonably mitigate potential impacts of mineral development for the following:

- land surface and vegetation disturbance;
- water table alterations that affect bear foods on the surface; and
- construction, operation, and reclamation of mine-related facilities such as impoundments, rights of way, motorized routes, pipelines, canals, transmission lines, or other structures.

NCDE-STD-MIN-03

PCAZ1-NCDE-STD-08: Within the NCDE primary conservation area and zone 1, in addition to measures included in the food/wildlife attractant special order(s), new plans of operation, permits, and/or leases for mineral activities shall include the following measures regarding grizzly bear attractants:

- bear-resistant food storage and garbage containers shall be used at development sites and at any campgrounds or dispersed sites where exploration or production-related human occupancy is anticipated;
- garbage shall be removed in a timely manner;
- road kills shall be removed daily during active operating periods to a designated location determined in close coordination with Montana Fish, Wildlife and Parks;
- feeding of wildlife shall not be allowed; and
- locations of work camps shall be approved in advance of operations. Food storage requirements shall be strictly adhered to in any work camps.

NCDE-STD-MIN-04

PCAZ1-NCDE-STD-09: Within the NCDE primary conservation area and zone 1, if minerals activities have the potential to adversely affect grizzly bears or their habitat as determined by a site-specific

analysis, new plans of operation, permits, and/or leases for mineral activities shall include the following mitigation measures, stipulations, or surface use criteria regarding grizzly bear habitat:

- ground-disturbing activities in identified grizzly bear spring habitat (as identified in a site-specific biological evaluation or other environmental document) shall be avoided between April 1 and June 30. If timing restrictions are not practicable, other measures shall be taken to reasonably mitigate negative impacts of mineral activity to grizzly bears;
- seismic activity in identified grizzly bear denning habitat (as identified in a site-specific biological evaluation or other environmental document) shall be avoided during the denning season (see glossary). If timing restrictions are not practicable, other measures shall be taken to reasonably mitigate negative impacts to the grizzly bear;
- cumulative impacts of multiple concurrent seismic and/or drilling operations shall be limited by timing restrictions. If timing restrictions are not practicable, reasonable and appropriate measures shall be taken to mitigate negative impacts to the grizzly bear;
- reasonable and appropriate measures regarding the maintenance, rehabilitation, restoration, or mitigation of functioning aquatic systems and riparian habitat conservation areas shall identify how reclamation will occur, plant species to be used in reclamation, a timeframe of when reclamation will be completed, and monitoring criteria; and
- reclamation and revegetation of motorized routes, drilling pads, and other areas disturbed by mineral activities shall be completed as soon as practicable by the operator.

NCDE-STD-MIN-05

PCAZ1-NCDE-STD-10: Within the NCDE primary conservation area and zone 1, if mineral activities have the potential to adversely affect grizzly bears or their habitat as determined by a site-specific analysis, new plans of operation, permits, and/or leases shall include the following mitigation measures regarding motorized access:

- public motorized use that is not associated with minerals activities shall be prohibited on motorized routes constructed for exploration and/or development;
- a traffic management plan shall be developed as part of the proposed activity to identify when and how motorized routes will be used, maintained, and monitored (if required) and how motorized route standards and guidelines will be implemented after activities have ended;
- helicopter use associated with seismic activity, exploration, drilling, or development must follow an approved plan or permit; and
- speed limits shall be adopted on motorized routes if needed to prevent or reduce collisions with grizzly bears.

NCDE-STD-MIN-06

PCAZ1-NCDE-STD-11: Within the NCDE primary conservation area and zone 1, minerals contractors and lessees shall require employees to attend training related to safely living near and working in grizzly bear habitat prior to starting work and on an annual basis thereafter. *NCDE-STD-MIN-07*

Guidelines

PCAZ1-NCDE-GDL-01: Within the NCDE primary conservation area and zone 1, clover should not be used in seed mixes on NFS lands. Native seed mixes or those that are less palatable to grizzly bears should be used so that seeded areas do not become an attractant. *NCDE-GDL-WL-03*

PCAZ1-NCDE-GDL-02: Within the NCDE primary conservation area and zone 1, in addition to Forestwide guidelines, the following guidelines apply to new leasable minerals activities, including leases, surface use plans for proposed wells or operations, and permits to conduct seismic exploration or drilling. To reduce potential grizzly bear disturbance or displacement, helicopter use plans should:

- avoid establishing recurring helicopter use (see glossary), especially in spring habitats or other known important grizzly bear habitats or use areas; and
- avoid establishing landing zones, especially in spring habitats or other known important grizzly bear habitats or use areas. If a landing zone is deemed necessary for safe implementation of the seismic or surface use plan or permit to drill, the landing zone should be constructed only in an area that has had site-specific analysis and approval.

NCDE-GDL-MIN-01

PCAZ1-NCDE-GDL-03: Within the NCDE primary conservation area and zone 1, leasable energy activities should use the best available noise-reduction technology on equipment and motorized vehicles to reduce potential disturbance or displacement of grizzly bears, whenever possible. *NCDE-GDL-MIN-02*

PCAZ1-NCDE-GDL-04: Within the NCDE primary conservation area and zone 1, along motorized routes, seismic corridors, and pipelines constructed for leasable energy activities, wildlife cover should be maintained at regular intervals where present (this varies on a site-specific basis) in order to provide habitat connectivity for grizzly bears. *NCDE-GDL-MIN-03*

PCAZ1-NCDE-GDL-05: Within the NCDE primary conservation area and zone 1, for locatable and non-energy leasable minerals activities with the potential to adversely affect the grizzly bear or its habitat (this varies on a site-specific basis), the following tiered measures should be considered to mitigate impacts to grizzly bear habitat. Beginning at step 1, any subsequent steps would be implemented only if the prior steps are not possible or achievable.

- Step 1: The operator should reclaim the affected area back to suitable bear habitat that has similar or improved characteristics and qualities compared to the original habitat (such as the same native vegetation).
- Step 2: If step 1 is not attainable, operators should either acquire a perpetual conservation easement (or easements) or purchase comparable or better replacement grizzly bear habitat within the primary conservation area. Acquisition of habitat within connectivity corridors could also be considered for mitigation, when appropriate. Habitat acquired for mitigation may require a purchase rate of > 1:1 on an acreage basis, depending on the quality of habitat degraded and habitat available for acquisition.
- Step 3: If steps 1 and 2 are not achievable, the next option is to offset negative effects to bears and grizzly bear habitat with other appropriate types of actions.

NCDE-GDL-MIN-04

PCAZ1-NCDE-GDL-06: Within the NCDE primary conservation area and zone 1, carrying bear deterrent spray should be recommended to mineral permittees, lessees and operators to reduce the risk of grizzly bear-human conflicts. *NCDE-GDL-MIN-05*

PCAZ1-NCDE-GDL-07: Within the NCDE primary conservation area and zone 1, available resources at existing gravel pits should be used before constructing new pits to reduce the risk of grizzly bear disturbance or displacement associated with blasting of rock or crushing of gravel. *NCDE-GDL-MIN-06*

NCDE Z1 Plan Components

Desired Conditions

Z1-NCDE-DC-01: Within zone 1 on the Helena-Lewis and Clark National Forest (see figure 1- 2), roads and trails provide for public and administrative access to NFS lands. Grizzly bear habitat in zone 1 contributes to sustaining the recovery of the grizzly bear population in the NCDE and providing the opportunity for movement of male bears to provide genetic connectivity with the Greater Yellowstone Ecosystem. *NCDE-HNF Zone 1-DC-01*

Z1-NCDE-DC-02: On the Helena-Lewis and Clark National Forest, within zone 1 and the portion of zone 2 west of Interstate 15, NFS lands adjacent to highways are consolidated and other efforts to reduce barriers to genetic connectivity of grizzly bear populations are supported. *NCDE-HNF Zone 1&2-DC-02*

Standards

Z1-NCDE-STD-01: Within zone 1 on the Helena-Lewis and Clark National Forest (see figure 1-2), there shall be no net increase above the baseline in density of motorized routes (roads and trails) open to public motorized use during the non-denning season on NFS lands. Open motorized route density is calculated by dividing the total miles of open motorized routes on NFS lands in zone 1 by the total square miles of NFS land area in that same area (see figure 1-2). This standard does not apply to the following:

- motorized use by agency personnel or others authorized by the appropriate agency personnel;
- temporarily opening a road for a short period of time to allow for public firewood gathering and other authorized use;
- updated or improved road data without an actual change on the ground;
- changes in technology or projections that result in changed calculations without actual change on the ground (e.g., a switch in geodetic systems from the North American Datum of 1927 to the North American Datum of 1983);
- a road closure location is moved a short distance to a better location (e.g., to the nearest intersection or turnout) to allow a turn-around providing for public safety, to reduce vandalism, or to improve enforcement of the road closure;
- the agency exchanges, acquires, buys, or sells lands with motorized routes;
- a change in an open road necessary to comply with federal laws;
- motorized use for mining activities (as authorized under the Mining Law of 1872) and oil and gas activities (as authorized under the Federal Onshore Oil and Gas Leasing Reform Act of 1987) conducted in accordance with valid existing rights and applicable standards and guidelines;
- a change in a motorized route necessary to address grizzly bear-human conflicts, resource damage, or human safety concerns;
- use of motorized routes in emergency situations as defined by 36 CFR 218.21; and
- temporary roads (see glossary).

NCDE-HNF Zone 1-STD-01

NCDE PCA Plan Components

Desired Conditions

PCA-NCDE-DC-01: Within the NCDE primary conservation area, motorized access provides for multiple uses (such as harvesting of timber and non-timber forest products; hunting, fishing, and recreation opportunities) on NFS lands while providing open motorized route density, total motorized route density, and secure core levels that contribute to sustaining the recovery of the grizzly bear population in the NCDE. *NCDE-DC-AR-01*

PCA-NCDE-DC-02: Within the NCDE primary conservation area, the number, capacity, and improvements of developed recreation sites provide for user comfort and safety while minimizing the risk of grizzly bear-human conflicts on NFS lands. *NCDE-DC-AR-02*

PCA-NCDE-DC-03: Within each bear management unit in the primary conservation area, increases in the number and capacity of developed recreation sites on NFS lands that are designed and managed for overnight use during the non-denning season are at levels that contribute to sustaining the recovery of the grizzly bear population in the NCDE. *NCDE-DC-AR-03*

PCA-NCDE-DC-04: Within the NCDE primary conservation area, the amount, type, and distribution of vegetation provide for the ecological, social, and economic sustainability of NFS lands while providing habitat components that contribute to sustaining the recovery of the grizzly bear population in the NCDE. *NCDE-DC-VEG-01*

PCA-NCDE-DC-05: Within the NCDE primary conservation area, there is a mosaic of successional stages to provide for grizzly bear habitat needs over the long term. *NCDE-DC-VEG-02*

PCA-NCDE-DC-06: Within the NCDE primary conservation area, the number, capacity of, and improvements on cattle and sheep grazing allotments support ecologically sustainable grazing, and temporary grazing permits are used effectively for management of noxious weeds while minimizing the risk of grizzly bear-human conflicts on NFS lands. *NCDE-DC-GRAZ-01*

Standards

PCA-NCDE-STD-01: In each bear management subunit within the NCDE primary conservation area, temporary changes in the open motorized route density, total motorized route density, and secure core shall be calculated for roads used for projects (as defined by "project (in grizzly bear habitat in the NCDE)") during the non-denning season (see glossary). Calculations will include estimated changes for each year of the anticipated duration of the project and shall be incorporated into the 10-year running average required by standard NCDE-STD-AR-03. *NCDE-STD-WL-03*

PCA-NCDE-STD-02: Within the NCDE primary conservation area, motorized use of roads with public restrictions shall be permitted for administrative use (see glossary) as long as doing so does not exceed either six trips (three round trips) per week or one 30-day unlimited use period during the non-denning season (see glossary). The exception to this standard is:

- emergency situations as defined by 36 Code of Federal Regulations (CFR) 218.21.

Note: Administrative use is not included in baseline calculations and is not included in calculations of net increases or decreases. If the level of administrative use exceeds this standard, the use is counted as a project (see "project (in grizzly bear habitat in the NCDE)" in the glossary). *NCDE-STD-AR-01*

PCA-NCDE-STD-03: In each bear management subunit within the NCDE primary conservation area, there shall be no net decrease to the baseline (see glossary) for secure core and no net increase to the baseline for open motorized route density or total motorized route density on NFS lands during the non-denning season (see glossary). The following conditions are not considered a net increase/decrease from the baseline:

- administrative use (see glossary);
- temporary use of a motorized route for a project (see "project (in grizzly bear habitat in the NCDE)" in the glossary) that meets the conditions stipulated in NCDE-STD-AR-03;
- mining activities (as authorized under the Mining Law of 1872) and oil and gas activities (as authorized under the Federal Onshore Oil and Gas Leasing Reform Act of 1987) conducted in accordance with valid existing rights and applicable standards and guidelines listed under NCDE-MIN;
- updated or improved data on a motorized route without an actual change on the ground;
- changes in technology or projections that result in changed open motorized route density, total motorized route density, or secure core values without actual change on the ground (e.g., a switch from the North American Datum of 1927 to the North American Datum of 1983 geodetic reference system);
- a road closure location is moved a short distance to a better location (e.g., to the nearest intersection or turnout) to allow a turn-around providing for public safety, to reduce vandalism, or to improve enforcement of the road closure;

- the agency exchanges, acquires, buys, or sells lands with motorized routes;
- a change in a motorized route necessary to comply with federal laws;
- a change in a motorized route necessary to address grizzly bear-human conflicts, human safety concerns, or resource damage or concerns (e.g., a road paralleling a stream may be decommissioned and replaced by a new upslope road to reduce water quality impacts);
- a change made by an adjacent landowner that decreases the percentage of secure core or increases open motorized route density or total motorized route density values on an adjacent national forest;
- use of a motorized route for emergency situations as defined by 36 CFR 218.21;
- temporary roads (see glossary).

NCDE-STD-AR-02

PCA-NCDE-STD-04: In each bear management subunit within the NCDE primary conservation area, temporary changes in open motorized route density, total motorized route density, and secure core shall be allowed for projects (as defined by "project (in grizzly bear habitat in the NCDE)" in the glossary). The 10-year running average for open motorized route density, total motorized route density, and secure core shall not exceed the following limits during the non-denning season (see glossary):

- 5 percent temporary increase in open motorized route density in each bear management subunit (i.e., open motorized route density baseline plus 5 percent);
- 3 percent temporary increase in total motorized route density in each bear management subunit (i.e., total motorized route density baseline plus 3 percent); and
- 2 percent temporary decrease in secure core in each bear management subunit (i.e., secure core baseline minus 2 percent).
- Exceptions to this standard include
- temporary changes for emergency situations as defined by 36 CFR 218.21
- temporary changes for actions where valid existing rights preclude or constrain agency discretion (e.g., certain contracts, permits, leases).

NCDE-STD-AR-03

PCA-NCDE-STD-05: Within the NCDE primary conservation area, a restricted road may be temporarily opened for public motorized use to allow authorized uses (such as firewood gathering), provided the period of use does not exceed 30 consecutive days during one non-denning season and occurs outside of spring and fall bear hunting seasons. However, temporary public use of a restricted road shall not be authorized in secure core (see glossary). *NCDE-STD-AR-04*

PCA-NCDE-STD-06: Within the NCDE primary conservation area, the number and capacity of developed recreation sites on NFS lands that are designed and managed for overnight use by the public during the non-denning season (e.g., campgrounds, cabin rentals, huts, guest lodges, recreation residences) shall be limited to one increase above the baseline (see glossary) in the number or capacity per decade per bear management unit. The following conditions are not considered an increase from the baseline:

- the agency obtains better information or updated information in its database(s);
- the agency acquires land that contains developed recreation sites;
- the agency increases the number or capacity of a developed recreation site in order to comply with federal laws;
- the agency maintains or modifies an existing overnight developed or dispersed recreation site in such a way that does not increase the number or capacity of the site (e.g., installing a pit toilet to avoid damage to water resources or installing a bear-resistant food storage structure to reduce grizzly bear-human conflicts);

- the agency modifies an existing developed recreation site to enhance human safety (e.g., enlarging a road pullout to allow trailers to safely turn around);
- the agency operates a developed recreation site to allow overnight use only during the denning season (see glossary); and
- the agency makes a corresponding reduction in the number or capacity of overnight developed recreation sites in the same bear management unit through any of the following means: (1) equal reduction in capacity at another site; (2) closure of a developed site(s); or (3) consolidation and/or elimination of dispersed camping, when and where it can be enforced effectively and it is reasonably assured that new dispersed sites will not develop nearby. If these measures are used to offset an increase in number or capacity, they must be in place before the initiation of the increase. If the agency reduces the number or capacity of developed sites below baseline levels, these reductions may be used at a future date to mitigate equivalent impacts of an increase, expansion, or change of use in developed sites within that bear management unit.

Note: This standard does not apply to dispersed recreation sites or to developed recreation sites managed for day use only (e.g., outfitter camps, roadside trail crossings, or interpretive pullouts; trailheads, picnic areas, or boat launches that are closed at night; ski areas that do not have overnight lodging). *NCDE-STD-AR-05*

PCA-NCDE-STD-07: Within the NCDE primary conservation area, new or reauthorized recreation permits shall include a clause providing for modification, cancellation, suspension, or temporary cessation of activities if needed to resolve a grizzly bear-human conflict situation. *NCDE-STD-AR-06*

PCA-NCDE-STD-08: Within the NCDE primary conservation area, new or reauthorized permits for ski areas on NFS lands that operate during the non-denning season shall include requirements to limit the risk of grizzly bear-human conflicts (e.g., to store garbage in a bear-resistant manner). *NCDE-STD-AR-07*

PCA-NCDE-STD-09: Within modeled grizzly bear denning habitat in the NCDE primary conservation area, there shall be no net increase in the percentage of area or miles of routes designated for motorized over-snow vehicle use on NFS lands during the den emergence time period (see glossary). *NCDE-STD-AR-08*

PCA-NCDE-STD-10: Within the NCDE primary conservation area, a sheep grazing permit in non-use status shall not be allowed to increase allowable animal unit months beyond what was previously permitted prior to being in non-use when it is returned to use. *NCDE-STD-GRZ-02*

PCA-NCDE-STD-11: Within the NCDE primary conservation area, there shall be no net increase in the number of active cattle grazing allotments above the baseline (see glossary) on NFS lands. Note: Existing allotments may be combined or divided as long as doing so does not result in grazing allotments in currently unallotted lands. *NCDE-STD-GRZ-05*

PCA-NCDE-STD-12: Within the NCDE primary conservation area, new leases for leasable minerals shall include a no surface occupancy stipulation (see glossary). *NCDE-STD-MIN-08*

Guidelines

PCA-NCDE-GDL-01: In each bear management subunit within the NCDE primary conservation area, each project (as defined by "project (in grizzly bear habitat in the NCDE)" in the glossary) should be designed so that on-the-ground implementation does not exceed 5 years to reduce the potential for grizzly bear disturbance or displacement. Exceptions may be made where necessary, for example to accommodate:

- actions where existing rights preclude or constrain agency discretion (e.g., certain contracts, permits, leases);

- prescribed burning (including slash disposal), best management practices to protect water quality, or required reforestation activities; or
- emergency situations as defined by 36 CFR 218.21.

If an extension to the five-year time limitation is required (e.g., to meet contractual obligations or to complete on-the-ground treatments), the reasons should be documented in writing prior to authorization of the extension. *NCDE-GDL-AR-01*

PCA-NCDE-GDL-02: Within the NCDE primary conservation area, secure core, open motorized route density, and total motorized route density should be restored to pre-project levels (as defined by "project (in grizzly bear habitat in the NCDE)" in the glossary) within 1 year after completion of the project to reduce the potential duration of grizzly bear disturbance due to project-related activities. Exceptions may be made where necessary, for example to accommodate:

- actions where existing rights preclude or constrain agency discretion (e.g., certain contracts, permits, leases);
- prescribed burning (including slash disposal), best management practices to protect water quality, or required reforestation activities; or
- emergency situations as defined by 36 CFR 218.21.

If an extension to the 1-year time limitation is made (e.g., to meet contractual obligations or to complete on-the-ground treatments), the reasons should be documented in writing prior to authorization of the extension. *NCDE-GDL-AR-02*

PCA-NCDE-GDL-03: Within the NCDE primary conservation area, if the number or capacity of day-use or overnight developed recreation sites is increased, the project should include one or more measures to reduce the risk of grizzly-bear human conflicts in that bear management unit. The measure(s) should be in place prior to completion of the project or be included as one of the design criteria. Measures can include but are not limited to additional public information and education; providing backcountry food-hanging poles or bear-resistant food or garbage storage devices; project design criteria that would limit capacity increases to those needed for public health and safety; and increasing law enforcement and patrols. *NCDE-GDL-AR-03*

PCA-NCDE-GDL-04: Within the NCDE primary conservation area, measures to reduce the risk of disturbance to the grizzly bear population should be incorporated into vegetation and fuels project design criteria, which vary on a site-specific basis (e.g., some activities should be restricted in spring habitat during the spring; areas with low levels of human activity should be provided adjacent to areas with high levels of disturbance). Note: Management activities such as pre-commercial thinning, burning, weed spraying, and implementation of road best management practices may need to be completed during the spring in order to meet resource objectives (especially if needed to prevent resource damage), in which case other measures should be used to reduce the risk of disturbance (e.g., limiting the duration of the activity or limiting the use of closed roads). *NCDE-GDL-VEG-01*

PCA-NCDE-GDL-05: Within the NCDE primary conservation area, vegetation management activities should be designed to avoid detrimental effects on the grizzly bear population and to include one or more measures to protect, maintain, increase, and/or improve grizzly habitat quantity or quality (e.g., promoting growth of berry-producing shrubs, forbs, or grasses known to be bear foods) in areas where it would not increase the risk of grizzly bear-human conflicts. *NCDE-GDL-VEG-02*

PCA-NCDE-GDL-06: Within the NCDE primary conservation area, measures to retain cover (where present) along a portion of grass/forb/shrub openings, riparian wildlife habitat, or wetlands should be incorporated in project design criteria (this varies on a site-specific basis). *NCDE-GDL-VEG-03*

PCA-NCDE-GDL-07: Within the NCDE primary conservation area, vegetation management projects (including timber sales and other non-commercial vegetation management contracts) should include a

provision for modification, cancellation, suspension, or temporary cessation of activities, if needed, to resolve a grizzly bear-human conflict situation. *NCDE-GDL-VEG-04*

PCA-NCDE-GDL-08: To reduce the risk of grizzly-bear human conflicts within the NCDE primary conservation area, vegetation management activities designed to enhance grizzly habitat (e.g., to increase huckleberry production) should not occur in or next to campgrounds, administrative facilities, or other developed recreation sites that operate during the non-denning season. *NCDE-GDL-VEG-05*

PCA-NCDE-GDL-09: On NFS lands within the NCDE primary conservation area, the number of open or active sheep grazing allotments should be reduced if an opportunity exists with a willing permittee, to reduce the risk of conflicts with grizzly bears. *NCDE-GDL-GRZ-01*

PCA-NCDE-GDL-10: Within the NCDE primary conservation area, an allotment management plan and plan of operation should specify any needed measures to protect key grizzly bear food production areas (e.g., wet meadows, stream bottoms, aspen groves, and other riparian wildlife habitats) from conflicting and competing use by livestock (this varies on a site-specific basis). *NCDE-GDL-GRZ-02*

Recreation Settings (ROS)

Desired Conditions

FW-ROS-DC-01: Outdoor recreation opportunities and experiences are available year-round in a range of settings as described by the desired recreation opportunity spectrum. These settings reflect the integration of other resource values with the desired recreation opportunities, access, facilities, and infrastructure provided within those settings.

The desired distribution of forestwide recreation opportunity settings are described in Table 14. Specific locations and distribution of desired recreation opportunity spectrum settings are mapped for each GA and are in appendix A.

Table 14. Desired recreation opportunity spectrum settings

Desired recreation opportunity spectrum settings	ROS		Winter ROS	
	Acres	Percent of total forest[1]	Acres	Percent of total forest[1]
Primitive	1,034,673	36	1,018,346	35
Semi-primitive nonmotorized	749,649	26	856,841	30
Semi-primitive motorized	375,866	13	725,625	25
Roaded natural	694,044	24	253,979	9
Rural	28,982	1	28,432	1
Urban	0	0	0	0

FW-ROS-DC-02: Primitive ROS settings encompass large, wild, remote, and predominately unmodified landscapes. These settings often coincide with designated wilderness. Additional primitive ROS settings are scattered across the forest, often surrounded by SPNM settings. Primitive ROS settings contain no motorized recreation and little probability of seeing other people. They provide quiet solitude away from roads and people, are generally free of human development, and facilitate self-reliance and discovery. Historic structures such as log ranger stations and fire lookouts are occasionally present. Signing and other infrastructure is minimal and constructed of rustic, native materials.

FW-ROS-DC-03: Primitive ROS settings (winter) are large, remote, wild, and predominately unmodified. Winter primitive ROS settings provide quiet solitude away from roads, and people. There is

no motorized activity and little probability of seeing other people. Constructed trails that are evident in the summer months are covered by snow, making these settings appear even more natural and untouched by human management.

FW-ROS-DC-04: Semi-Primitive Non-Motorized settings provide opportunities for exploration, challenge, and self-reliance. Rustic structures such as signs and foot bridges are occasionally present to direct use and/or protect the setting's natural and cultural resources. These rustic constructed features are built from native materials or those that mimic native materials. Historic structures such as log ranger stations and fire lookouts are occasionally present. Closed roads may be present but do not dominate the landscape or detract from the SPNM experience of visitors.

These settings are free of motorized recreation travel but mechanized travel may be present.

FW-ROS-DC-05: Semi-Primitive Non-Motorized settings (winter) provide backcountry skiing, snowboarding, and snowshoeing opportunities. Trails are ungroomed and often not marked. Rustic facilities, such as historic cabins and yurts may exist but are rare.

Recreation Opportunities (REC)

Desired Conditions

FW-REC-DC-01: Recreation opportunities enable visitors to connect with the unique natural environments and historic and cultural occurrences that have taken place throughout the area and instill a culture of stewardship and appreciation.

FW-REC-DC-02: Activities associated with recreational opportunities contribute to jobs and income in the local economy, community stability or growth, and the quality of lifestyles.

FW-REC-DC-03: Sustainable levels of developed recreation sites and facilities exist at key locations to accommodate concentrations of recreation use and enhance visitor experiences.

FW-REC-DC-04: Recreation facilities, including trails and dispersed sites, and their uses have minimal impacts on resources including at risk species, heritage and cultural sites, water quality, and aquatic species.

FW-REC-DC-05: Recreation rental cabins and rental lookouts provide unique and/or historic overnight facilities.

FW-REC-DC-06: Vegetation within developed recreation sites is healthy and resilient and provides for the health and safety of the public. Also see FW-VEGT-DC-04.

FW-REC-DC-07: Dispersed recreation camping sites (development scale 1-2) provide undeveloped camping opportunities while considering cultural and natural resource concerns, activity and recreation user conflicts, and over-use.

Objectives

FW-REC-OBJ-01: Rehabilitate at least five dispersed recreation sites (development scale 1-2) which have erosion or sanitation issues.

FW-REC-OBJ-02: Rehabilitate or relocate at least five existing recreation facilities, including dispersed sites, if they are degrading surface or riparian resources.

FW-REC-OBJ-03: Improve accessibility of facilities or programs at at least five developed recreation sites (development scale 3-5), such as campgrounds, trailheads, cabin rentals, or the Lewis and Clark National Historic Trail Interpretive Center.

FW-REC-OBJ-04: Rehabilitate or refurbish at least five developed recreation sites (development scale 3-5) to meet current and future projected demands.

Guidelines

FW-REC-GDL-01: Management of developed recreation facilities should be responsive to environmental changes such as but not limited to changes in water flows, snow levels, snow elevation, fish and wildlife habitats, vegetative conditions, and seasonal recreation use.

FW-REC-GDL-03: To maintain quality and quantity of water flows to, within, or between groundwater dependent ecosystems, groundwater use facilities at recreation and administrative sites should not: a) be developed in RMZs (unless no alternatives exist); b) measurably lower river flows, lake levels, or flows to wetlands or springs (for example change springs from perennial to intermittent, or eliminate springs altogether); and/or c) discharge pollutants directly to groundwater.

FW-REC-GDL-04: To reduce potential impact to fishery resources, avoid placing new facilities or infrastructure within expected long-term channel migration zone. Where new activities inherently must occur in RMZs (for example road stream crossings, boat ramps, docks, and interpretive trails), locate them to minimize impacts on riparian associated resource conditions.

FW-REC-GDL-05: Where existing recreation facilities are located within RMZs and degrading aquatic or riparian resources, consider removing or relocating such facilities outside of RMZs or use other means practicable to reduce effects. In RMZs, areas where developed recreation facilities have been removed should be rehabilitated to a natural state.

FW-REC-GDL-06: To protect resources, new and reconstructed solid and sanitary waste facilities should not be located within inner RMZs.

FW-REC-GDL-07: To reduce the potential for bear/human conflicts, plantings and seed mixes near roads and developed recreation facilities should not contain plant species that may attract bears. Also see FW-NCDE-DC-01, PCAZ1-NCDE-GDL-01, PCA-NCDE-GDL-08, and NCDE-GDL-VEG-05.

Recreation Special Uses (RSUP)

Desired Conditions

FW-RSUP-DC-01: Recreation special uses provide unique opportunities, services, and experiences for the recreating public and/or attend to a demonstrated demand for a specific recreation opportunity.

FW-RSUP-DC-02: Services provided by recreation special uses enhance the recreation experiences of forest visitors, while ensuring public health and safety and protecting natural and cultural resources. Also see FW-CR-DC-03.

FW-RSUP-DC-03: Recreation special uses contribute to jobs and income in the local economy, community stability or growth, and the quality of lifestyles throughout the forest while remaining compatible with ecological and social capacity thresholds.

Guidelines

FW-RSUP-GDL-01: To mitigate conflicts with other users, recreation operations, under (or being considered for) special use authorizations, should include permit measures that address potential conflicts such as, but not limited to: location of the event, timing of the event, party size, and education on the reduction of human-wildlife conflict.

Recreation Access (ACCESS)

Desired Conditions

FW-ACCESS-DC-01: Forest system roads and trails provide a variety of motorized, nonmotorized, and mechanized recreation transport access to the Forest, during summer and winter seasons. Routes provide access to key destinations on the forest. Unauthorized recreation routes are not present on the landscape.

FW-ACCESS-DC-02: Airstrips provide opportunities for motorized recreation aviation access.

FW-ACCESS-DC-03: Forest visitors use the designated system of roads, trails, and airstrips to access recreation activities appropriate within identified recreation opportunity setting locations.

Goals

FW-ACCESS-GO-01: The Forest Service works in cooperation with landowners, other agencies, and partners to provide legal access to public lands.

Guidelines

FW-ACCESS-GDL-01: To protect natural and cultural resources, projects and other management activities should be designed to prevent the creation and/or use of unauthorized recreation routes, and to rehabilitate existing ones to the extent practicable.

FW-ACCESS-GDL-02: New trailheads, for both motorized and nonmotorized recreation uses, and airstrips should be strategically located to provide safe and convenient staging for recreation opportunities.

Scenery (SCENERY)

Desired Conditions

FW-SCENERY-DC-01: The natural and cultural attributes of the Forest's scenery are described in the scenic character descriptions, see appendix G.

FW-SCENERY-DC-02: Scenery integrity objectives contribute to and establish the sense of place of local communities.

FW-SCENERY-DC-03: Scenic integrity objectives are in harmony with and contribute to desired recreation settings and experiences. See FW-ROS-Table 15.

Guidelines

FW-SCENERY-GDL-01: To achieve or maintain the identified scenic integrity objectives on the forest:

- Vegetative management activities should reflect natural disturbance regimes and processes.
- Desired scenic integrity objectives should be met during management activities to ensure scenery continues to contribute to the sense of place of the Forests' landscapes.
- The construction or reconstruction of FS facilities should harmonize with or complement the character of the landscape settings. Also see FW-ROS-DC-01.

Designated Wilderness (WILD)

Desired Conditions

FW-WILD-DC-01: Designated wilderness areas provide for wilderness character as defined by the Wilderness Act and the wilderness areas' enabling legislation.

FW-WILD-DC-02: Natural ecological processes (e.g., plant succession) and disturbances (e.g., wildfire, insects, and disease) are the primary forces affecting the composition, structure, and pattern of vegetation. Fire plays a role as a natural disturbance agent within designated wilderness areas.

FW-WILD-DC-03: The large remote areas within designated wilderness areas contribute habitats for species with large home ranges such as wide-ranging carnivores (e.g., grizzly bear) and species found primarily in these habitats, such as mountain goats. Habitat conditions in designated wilderness contribute to wildlife movement within and across the Forest.

FW-WILD-DC-04: Water bodies and riparian areas provide undisturbed quality habitat for fish, amphibians, and other aquatic-associated species.

FW-WILD-DC-05: Facilities within designated wilderness provide for the management, protection, and use of the wilderness. Facilities and structures with significant historic values contribute to the wilderness character. Facilities, trails, and signage within wilderness areas are minimal and constructed of rustic, native, or natural-appearing materials.

FW-WILD-DC-06: Outfitter and guide opportunities provide services that respond to relevant public need.

FW-WILD-DC-07: The Bob Marshall, Scapegoat, and Gates of the Mountains Wilderness Areas are maintained as Class I Air Quality areas. See also FW-AQ-DC-01.

Goals

FW-WILD-GO-01: The HLC NF works in collaboration with adjacent national forests to manage the Bob Marshall Wilderness Complex, which includes the Great Bear, Bob Marshall, and Scapegoat Wilderness Areas.

Guidelines

FW-WILD-GDL-01: To protect water quality and aquatic habitats, grazing of recreational livestock should not be permitted within 100 feet of water sources.

FW-WILD-GDL-02: To protect cave resources, known caves and new cave discoveries should not be signed, disclosed on maps, mentioned in brochures, or have permanent reference marking except when necessary for resource protection.

Suitability

FW-WILD-SUIT-01: Designated wilderness areas are suitable for existing livestock grazing allotments, but they are not suitable for new or expanded livestock grazing allotments.

FW-WILD-SUIT-02: Designated wilderness areas are not suitable for motorized uses or mechanized means of transport (including bicycles) except as allowed by enabling legislation.

FW-WILD-SUIT-03: Designated wilderness areas are not suitable for timber production or timber harvest.

FW-WILD-SUIT-04: Designated wilderness areas are not suitable for commercial use of non-timber forest products (e.g., firewood, mushrooms, huckleberries), but are suitable for personal and agency use.

FW-WILD-SUIT-05: Designated wilderness areas are not suitable for permanent structures unless they are necessary to meet minimum requirement for the administration of the area.

Recommended Wilderness Areas (RECWILD)

Desired Conditions

FW-RECWILD-DC-01: Recommended wilderness areas preserve opportunities for inclusion in the National Wilderness Preservation System. The ecological and social characteristics that provided the basis for each area's suitability for wilderness recommendation are protected and maintained.

FW-RECWILD-DC-02: Recommended wilderness areas are characterized by a natural environment where ecological processes such as natural succession, wildfire, avalanches, insects and disease function as the primary forces affecting the environment.

FW-RECWILD-DC-03: Recommended wilderness areas provide outstanding opportunities for solitude or primitive and unconfined recreation.

Standards

FW-RECWILD-STD-01: Within recommended wilderness areas new leases for leasable minerals shall include a no surface occupancy stipulation.

Suitability

FW-RECWILD-SUIT-01: Motorized and mechanized means of transport are not suitable in recommended wilderness areas. Exceptions may be made for authorized permitted uses, valid existing uses, or in emergencies involving public health and safety that are determined on a case by case basis.

FW-RECWILD-SUIT-02: Recommended wilderness areas are suitable for restoration activities (such as management ignited fires, active weed management) to protect and/or enhance the wilderness characteristics of these areas.

FW-RECWILD-SUIT-03: Motorized and mechanized equipment (such as chain saws to clear trails) are suitable for accomplishing restoration activities and/or administrative work.

FW-RECWILD-SUIT-04: Recommended wilderness areas are not suitable for timber production or timber harvest.

FW-RECWILD-SUIT-05: Recommended wilderness areas are not suitable for new commercial communication sites and new utility corridors.

FW-RECWILD-SUIT-06: Recommended wilderness areas are not suitable for road construction or reconstruction.

FW-RECWILD-SUIT-07: Recommended wilderness areas are not suitable for new developed recreation sites and/or facilities.

FW-RECWILD-SUIT-08: Recommended wilderness areas are suitable for existing livestock grazing allotments, but they are not suitable for new or expanded livestock grazing allotments.

Wilderness Study Areas (WSA)

Desired Conditions

FW-WSA-DC-01: Wilderness study areas are characterized by a natural environment where ecological processes such as natural succession, wildfire, avalanches, insects and disease function as the primary forces affecting the environment.

FW-WSA-DC-02: Wilderness study areas primarily offer opportunities for primitive recreation, although uses established and allowed prior to the enabling legislation are retained if they maintain the wilderness

character and the potential for inclusion in the National Wilderness Preservation System that existed in 1977.

Standards

FW-WSA-STD-01: Within the wilderness study areas new leases for leasable minerals shall include a no surface occupancy stipulation.

Suitability

FW-WSA-SUIT-01: Wilderness study areas are not suitable for timber production or timber harvest.

FW-WSA-SUIT-02: Wilderness study areas are not suitable for new commercial communication sites or new utility corridors.

FW-WSA-SUIT-03: Wilderness study areas are suitable for restoration activities (such as management ignited fires, active weed management) to protect and/or enhance the wilderness characteristics of these areas.

FW-WSA-SUIT-04: Motorized and mechanized equipment (such as chain saws to clear trails) is suitable for accomplishing restoration activities and/or administrative work.

FW-WSA-SUIT-05: New road construction or reconstruction is not suitable in wilderness study areas. However, reconstruction or rerouting existing roads to eliminate impacts to natural or cultural resources is suitable provided abandoned routes are fully rehabilitated.

FW-WSA-SUIT-06: Wilderness study areas are not suitable for new developed recreation facilities.

FW-WSA-SUIT-07: Wilderness study areas are suitable for existing livestock grazing allotments, but they are not suitable for new or expanded livestock grazing allotments.

FW-WSA-SUIT-08: Wilderness study areas are suitable for motorized uses and mechanized means of transport if allocated by forest travel plans, not precluded by other designations or policy, and retained the wilderness character and the potential for inclusion in the National Wilderness Preservation System that existed in 1977.

Inventoried Roadless Areas (IRA)

Desired Conditions

FW-IRA-DC-01: Inventoried roadless areas provide large, undisturbed, and unfragmented areas of land. These large land areas sustain high quality or undisturbed soil, water, and air and a diversity of plant and animal communities. They also provide for secure habitats for a variety of fish and wildlife species that are dependent upon large, undisturbed, unfragmented areas of land.

FW-IRA-DC-02: Within inventoried roadless areas, natural, ecological processes and disturbances (such as wildfire, insects, and disease) are the primary forces affecting the composition, structure, and pattern of vegetation. Inventoried roadless areas contribute to reference landscapes for future study and understanding of natural ecological processes.

FW-IRA-DC-03: Landscapes in inventoried roadless areas are naturally appearing with high scenic quality.

FW-IRA-DC-04: Inventoried roadless areas provide remote primitive and semiprimitive recreation opportunities in natural settings.

FW-IRA-DC-05: Inventoried roadless areas protect sources of public drinking water, traditional cultural properties and sacred sites, and locally identified unique characteristics, where they exist.

Suitability

FW-IRA-SUIT-01: Inventoried roadless areas are unsuitable for timber production. However, timber harvest is suitable within inventoried roadless areas outside of wilderness study areas and recommended wilderness areas to provide for other multiple use values when consistent with the 2001 Roadless Area Conservation Rule.

FW-IRA-SUIT-02: Forest system roads (that are managed as part of the forest transportation system) in inventoried roadless areas are suitable for motorized and mechanized means of transport.

FW-IRA-SUIT-03: Inventoried roadless areas are suitable for restoration activities (such as management ignited fires, active weed management) to protect and/or enhance the roadless area values and characteristics of these areas.

Eligible Wild and Scenic Rivers (WSR)

Guidelines

FW-WSR-GDL-01: To protect the eligibility of river segments, interim protection measures should be implemented within ¼ mile of either side of identified eligible river segment. These interim protective measures apply to the future use and management along the eligible river until they are changed through an act of Congress or unless a river is determined not suitable for designation through a suitability study.

Table 24 describes the interim protection measures applied to the management of eligible wild, scenic, or recreational river segments. For additional information on river segments please see Appendix F.

Table 24. Interim protection measures for eligible river segments

Project/activity	Interim Protection Measures		
	Wild	**Scenic**	**Recreational**
Water resource projects: Dams Diversions Flood control Activities that affect free-flow	Wild, Scenic, and Recreational: Water resource projects on eligible rivers should be analyzed as to their effects on a rivers free-flow, water quality, and identified outstanding remarkable values, with adverse effects to be prevented to the extent of the existing agency authority (such as special use authority).		
Hydroelectric power facilities	Wild, Scenic, and Recreational: FS-identified eligible rivers should be protected pending a suitability determination.		
Minerals: locatable	Wild, Scenic, and Recreational: Subject to valid existing rights, existing or new mining activity on an identified eligible river are subject to regulations in 36 Code of Federal Regulations Part 228, subpart A and should be conducted in a manner that minimizes surface disturbance, sedimentation, pollution, and visual impairment.		
Leasable	Leases, licenses, and permits under mineral leasing laws should include conditions necessary to protect the values of the river corridor that make it eligible for inclusion in the national system.		
Minerals Saleable	Disposal of saleable mineral material is prohibited.	Disposal of saleable mineral material is allowed if the values of the river corridor that make it eligible for inclusion in the national system are protected.	
Transportation system	Roads and railroads are generally not compatible.	Roads and railroads may parallel the river for short segments or bridge the river if such construction	Roads and railroads are permitted to parallel the river if such construction fully protects river outstanding remarkable

Project/activity	Interim Protection Measures		
	Wild	**Scenic**	**Recreational**
	Prevent actions related to the road system that would preclude protection of the river as wild. Do not plan roads outside of the corridor that would adversely affect the wild classification. New trail construction should generally be designed for nonmotorized users. New airfields may not be developed.	protects the river values, including the free-flowing character. Bridge crossings and access points are allowed. New trail construction and airfield development should be compatible and fully protect river outstanding remarkable values.	values, including the free-flowing character. Bridge crossings and access points are allowed. New trail construction and airfield development should be compatible and fully protect river outstanding remarkable values.
Utility proposals	Wild, Scenic, and Recreational: New transmission lines such as gas lines, water lines, and similar linear features are not compatible with eligible wild and scenic rivers and are discouraged. Any portion of a utility proposal that has the potential to affect the river's free-flowing character must be evaluated as a water resources project.		
Recreation developments	Major public use areas such as large campgrounds, interpretive centers, or administrative headquarters must be located outside of the river corridor. Minimum facilities such as toiles and refuse containers may be provided to protect and enhance water quality and other river values. Facilities must be located and designed to harmonize with the primitive character, must protect river values, and must be screened from view to the extent possible.	Public facilities, such as moderate sized campgrounds, simple sanitation and convenience facilities, public information centers, administration sites, and river access developments are allowed. Facilities must be located and designed to harmonize with the natural and cultural settings, must protect river values, including water quality, and must be screened from view to the extent possible.	Recreation, administration, and river access facilities may be in close proximity to the river. However, recreational classification does not require recreation development. Facilities must be located and designed to harmonize with the natural and cultural settings, must protect river values, including water quality, and must be screened from view to the extent possible.
Motorized travel	Motorized travel on land or water may be permitted but is generally not compatible. Where motorized travel is deemed necessary, uses should be carefully defined and impacts mitigated.	Motorized travel on land or water may be permitted, prohibited, or restricted to protect river outstanding remarkable values.	
Wildlife and fish projects	Construction of minor structures and vegetation management to protect	Construction of structures and vegetation management designed to	Construction of structures and vegetation management designed to protect and

Project/activity	Interim Protection Measures		
	Wild	**Scenic**	**Recreational**
	and enhance wildlife and fish habitat should harmonize with the area's primitive character and protect river outstanding remarkable values. Proposed wildlife or fisheries restoration or enhancement projects that have potential to affect the rivers free-flowing character must be evaluated as a water resources project.	protect and enhance wildlife and fish habitat should harmonize with the area's largely undeveloped character and protect river outstanding remarkable values. Any portion of a wildlife or fisheries restoration or enhancement projects that have potential to affect the rivers free-flowing character must be evaluated as a water resources project.	enhance wildlife and fish habitat should fully protect river outstanding remarkable values. Any portion of a wildlife or fisheries restoration or enhancement projects that have potential to affect the rivers free-flowing character must be evaluated as a water resources project.
Vegetation management	Cutting of trees and other vegetation is not permitted except when needed in association with a primitive recreation experience, to protect users, or to protect identified outstanding remarkable values.	A range of vegetation management and timber harvest practices are allowed, if these practices are designed to protect users, or protect, restore, or enhance the river environment, including the long-term scenic character.	
Domestic livestock grazing	Domestic livestock grazing should be managed to protect outstanding remarkable values. Existing structures may be maintained. New facilities may be developed so long as they maintain the outstanding remarkable values and the area's primitive character.	Domestic livestock grazing should be managed to protect outstanding remarkable values. Existing structures may be maintained. New facilities may be developed so long as they maintain the outstanding remarkable values and the area's largely undeveloped character.	Domestic livestock grazing should be managed to protect outstanding remarkable values. Existing structures may be maintained. New facilities may be developed so long as they maintain the outstanding remarkable values for which the river was found eligible.

Infrastructure – Roads (RT)

Desired Conditions

FW-RT-DC-01: A safe and cost-effective transportation system provides public and administrative access to FS lands while protecting natural and cultural resources.

FW-RT-DC-02: Roads that are not needed to serve administrative and public needs are not present.

FW-RT-DC-04: The transportation system has minimal impacts on resources including all wildlife, heritage and cultural sites, water quality, and aquatic species.

Goals

FW-RT-GO-03: The HLC NF cooperates with highway managers and other landowners to implement wildlife crossings that contribute to wildlife and public safety where needed.

Objectives

FW-RT-OBJ-01: Decommission or place into storage (maintenance level 1) at least 50 miles of roads. Priorities shall include roads causing resource damage in priority watersheds and/or where roads chronically fail.

FW-RT-OBJ-02: Complete at least 100 miles of reconstruction or road improvement projects. Priorities shall include reducing effects on: desired aquatic and riparian conditions from chronic sediment delivery or potential future road prism failures, and conservation watershed networks that have westslope cutthroat or bull trout habitats.

Guidelines

FW-RT-GDL-12: Roads not needed in the long term should be decommissioned to benefit fish and wildlife habitat (prioritizing native fish habitat), enhance the desired recreation opportunity spectrum settings and opportunities, and/or create a more cost-efficient transportation system.

FW-RT-GDL-13: To avoid impacts to wildlife, newly constructed or reconstructed roads, temporary roads, skid trails, and trails should avoid key seasonal habitats.

Benefits to People - Livestock Grazing (GRAZ)

Desired Conditions

FW-GRAZ-DC-01: Sustainable grazing opportunities are available for domestic livestock from lands suitable for forage production.

FW-GRAZ-DC-02: Within grazing allotments, rangelands are comprised of stable soils supporting a diverse species composition of grasses, forbs, and shrubs that create a healthy and resilient native plant community. Native plant communities provide for wildlife habitat and forage needs in addition to providing forage for domestic livestock.

FW-GRAZ-DC-03: Within grazing allotments, soil stability, and hydrologic and biotic integrity function in a manner that provides for resilience relative to site potential as described in ecological classifications.

Goals

FW-GRAZ-GO-01: Coordination with Montana Fish, Wildlife, and Parks wildlife biologists occurs during the allotment planning/permit process to ensure that wildlife habitat/forage needs are being addressed in conjunction with domestic livestock grazing.

Standards

FW-GRAZ-STD-02: Annual livestock use indicators within inner RMZs shall be set during the allotment management planning process at levels that move towards or maintain desired rangeland vegetation, riparian function, and wildlife habitat specific to the ecological site (or equivalent classification). Indicator values shall be adapted over time based on long-term monitoring and evaluation of conditions and trends.

Guidelines

FW-GRAZ-GDL-01: To maintain or improve riparian and aquatic conditions and achieve riparian desired conditions over time through adaptive management, new grazing authorizations and reauthorizations that contain low gradient, alluvial channels should require that end-of-season stubble

height be 10 to 15 cm (4 to 6 inches) along the greenline. However, application of the stubble height numeric value range should only be applied where it is appropriate to reflect existing and natural conditions for the specific geo-climactic, hydrologic, and vegetative conditions where it is being applied. Alternative use and disturbance indicators and values, including those in current ESA consultation documents, may be used if they are based on current science and monitoring data and meet the purpose of this guideline. Long-term monitoring and evaluation should be used to adapt this numeric range and/or the use of other indicators.

FW-GRAZ-GDL-02: To ensure grazing is sustainable and contributes to other resource desired conditions, forage use by livestock should maintain or enhance the desired structure and diversity of plant communities on grasslands, shrub lands, and forests and should maintain or restore healthy riparian conditions as defined in the allotment management plan.

FW-GRAZ-GDL-03: New or revised allotment management plans should design grazing practices (such as stocking rate, duration, timing), and/or physical structures to reduce negative effects to riparian areas or riparian dependent at risk species.

FW-GRAZ-GDL-04: Allotment management plans should incorporate adaptive management to move towards desired conditions for vegetation and riparian resources, considering both the needs and impacts of domestic livestock and wildlife.

FW-GRAZ-GDL-05: When updating or managing existing facilities that are located within RMZs, facilities should be minimized or relocated to other areas. Livestock management activities (trailing, bedding, watering, salting, loading, and other handling or management efforts) should be avoided in RMZs to reduce effects to riparian resources and aquatic biota. Also see FW-RMZ section for additional information.

FW-GRAZ-GDL-06: Livestock watering facilities should be constructed or maintained to provide for forage use that will maintain or enhance structure and diversity of plant communities on suitable rangelands, but avoid impacts to soil and water resources.

FW-GRAZ-GDL-07: To attract livestock out of riparian areas, salt and/or supplements should be placed at least one-quarter (1/4) mile away.

Benefits to People - Timber (TIM)

Desired Conditions

FW-TIM-DC-01: Lands identified as suitable for timber production support a regularly scheduled timber harvest program that provides sustainable levels of wood fiber products.

FW-TIM-DC-02: Although natural disturbances occur on lands suitable for timber production, actively managed lands are resilient and/or resistant to disturbance and economic loss of the timber resource is minimized.

FW-TIM-DC-03: Production of timber and timber harvest contribute to economic sustainability, providing jobs and income to local economies.

FW-TIM-DC-04: A variety of harvest and contract methods are offered in response to market demand and local needs.

Goals

FW-TIM-GO-01: Timber harvest from the HLC NF, along with timber harvested from other lands, contributes to maintaining regional timber harvesting and milling infrastructure, including support to

small businesses. When possible, efficiencies are gained across boundaries by utilizing available authorities for partnerships and agreements with entities, such as the state of Montana.

Objectives

FW-TIM-OBJ-01: Offer timber meeting product utilization standards for sale at an annual projected timber sale quantity of 4-7 MMCF (20-35 MMBF)[1], averaged on a 10-year basis. See appendix C for definition of timber utilization standards.

[1] A projected timber sale quantity level of approximately 7.9 MMCF (approximately 40 MMBF) would be possible within the constraints of the desired conditions and other plan components if budget was not considered as a limiting factor.

FW-TIM-OBJ-02: Offer an annual projected wood sale quantity consisting of both timber that meets utilization standards (FW-TIM-OBJ-01) plus other wood products (fuelwood, biomass, and other volumes that do not meet timber product utilization standards) for sale of 5.9-9.4 MMCF[1], averaged on a 10 year basis.

[1]A projected wood sale quantity level of approximately 10.5 MMCF would be possible within the constraints of the desired conditions and other plan components if budget was not considered as a limiting factor.

Standards

FW-TIM-STD-01: On lands both suitable and unsuitable for timber production, timber harvest will not occur where soil, slope, or other watershed conditions may be irreversibly damaged, as identified in project specific findings. Also see Aquatic Ecosystems and Soil sections.

FW-TIM-STD-02: On forested lands (both suitable and unsuitable for timber production), timber harvest shall only be used when there is reasonable assurance of restocking within 5 years after final regeneration harvest per legal mandate. Restocking levels are prescribed in a site-specific silvicultural prescription for a treatment unit and are determined to be adequate depending on the objectives and desired conditions for the plan area. In some instances, such as when stands are treated to reduce fuel loadings, to create openings for scenic vistas, or to prevent encroaching trees to meet desired vegetation or wildlife habitat conditions, it is acceptable not to restock or restock at low tree densities. Restocking considerations do not apply in nonforested plant communities.

FW-TIM-STD-03: On lands both suitable and unsuitable for timber production, silvicultural treatments shall not be selected based solely on their ability to provide the greatest dollar return or output of timber; other considerations such as the purpose and need shall inform the selection of silvicultural treatments.

FW-TIM-STD-04: On lands both suitable and unsuitable for timber production, clearcutting shall be used as a harvest method only where it has been determined to be the method most appropriate to meet the purpose and need of the project. Other types of even-aged harvest shall be used only where determined to be appropriate. Determinations shall be based on an interdisciplinary review of site conditions and the desired conditions for vegetation, wildlife habitat, scenery, and other resources.

FW-TIM-STD-05: On lands both suitable and unsuitable for timber production, harvest units shall be shaped and blended to the extent practicable with the natural terrain. Also see the guidelines for Scenery.

FW-TIM-STD-06: Even-aged stands shall reach a minimum of 95 percent of culmination of mean annual increment, as measured by cubic volume, prior to regeneration harvest, unless at least one of the following conditions have been identified during project development:

- When such harvesting would modify fire behavior to protect identified resource, social or economic values;
- When harvesting of stands will trend landscapes toward vegetation desired conditions;

- When harvest uses uneven-aged silvicultural systems, thinning, or other intermediate stand treatments that do not regenerate even-aged or two-aged stands;
- When harvest is for sanitation or salvage of timber stands that have been substantially damaged by fire, windthrow, 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.

FW-TIM-STD-07: The quantity of timber that may be sold per decade from lands both suitable and not suitable for timber production shall not exceed the sustained yield limit of 5.75 mmcf (31.21 mmbf) per year on the proclaimed Helena National Forest; and 4.95 mmcf (26.36 mmbf) per year on the proclaimed Lewis and Clark National Forest. The sustained yield limits for both proclaimed forests total 10.7 mmcf (57.57 mmbf) across the administratively combined HLC NF, except for salvage or sanitation cutting of trees damaged by fire, windthrow, or other disturbance or to manage insect infestation or disease spread. Such trees may be harvested above the sustained yield limit, where it is not feasible to substitute such timber for timber that would otherwise be sold under the plan and where such harvest is consistent with desired conditions for terrestrial and aquatic ecosystems.

FW-TIM-STD-08: The maximum opening size created by clearcutting, seedtree cutting, shelterwood seed cutting, or other cuts designed to regenerate an even-aged stand of timber in a single harvest operation shall normally be 40 acres. This standard applies to new harvest proposals on NFS lands only and need not consider existing openings on NFS lands, adjacent private or other agency lands. An exception applies to achieve desired ecological conditions for the plan area, including those associated with forest patterns, patch sizes and resilience in the short and long term (FW-VEGT-DC-01, 04 and FW-VEGF-DC-08, 09). The maximum opening size exception for the HLC NF is 75 acres. This is consistent with the estimated natural range of variation for average patch size of early successional forest openings.

FW-TIM-STD-09: Harvest openings, created as a result of a single harvest operation, that exceed the maximum opening sizes established in FW-TIM-STD-08 shall require 60-day public review and Regional Forester approval.

FW-TIM-STD-10: FW-TIM-STD-08 and FW-TIM-STD-09 shall not apply to the size of harvest openings created as a result of catastrophic (stand replacing) disturbances, such as fire or insect and disease infestations.

Guidelines

FW-TIM-GDL-01: To contribute to ecological sustainability and ecosystem health, when timber harvest and maintenance activities (such as precommercial thinning) are conducted, they should be designed to move the Forest toward achievement of vegetation desired conditions (such as species composition, size class, forest density, and landscape pattern) as well as other resource desired conditions.

FW-TIM-GDL-02: To help achieve desired conditions on lands unsuitable for timber production, but where timber harvest could occur, the use of timber harvest should be limited to the following purposes:

- Salvage dead or dying trees.
- Improve production of forage for livestock and wildlife.
- Reduce hazardous fuels and/or fire risk.
- Manage powerline right-of-ways.
- Mitigate forest insect or diseases.
- Move conditions toward desired stand or landscape vegetation composition, structure, and patterns, including restoration of ecosystem functions and improving resiliency.
- Maintain or enhance wildlife habitat.

- Perform research or administrative studies.
- Address issues of public safety and health.
- Improve recreation, infrastructure and/or scenic resource conditions, including creation of scenic vistas.

FW-TIM-GDL-03: To provide habitat for wildlife species associated with burned habitats, clusters of burned trees of a variety of sizes should be retained where it is safe to do so when salvaging timber in areas burned by high-severity wildfire.

Benefits to People - Fish and Wildlife (FWL)

Desired Conditions

FW-FWL-DC-02: Furbearers are present and potentially available to trappers on NFS lands, and habitat on NFS lands provides trapping opportunities that support Montana Fish, Wildlife and Parks population and harvest objectives.

FW-FWL-DC-04: Levels and types of public motorized access during the archery and rifle hunting seasons are balanced with desired conditions for wildlife populations and habitat security, as well as with other resource desired conditions. Also see Wildlife, Other.

Goals

FW-FWL-GO-01: Forest Service and Montana Fish, Wildlife, and Parks biologists cooperate to identify potential needs for and means to achieve desired distribution and hunting opportunity of elk and other big game species.

Guidelines

FW-FWL-GDL-01: Prior to management actions that would increase or change the location, timing, mileage, or density of wheeled motorized routes open during the archery and rifle hunting seasons, FS biologists should coordinate with Montana Fish, Wildlife, and Parks biologists to identify possible management actions that may reduce the potential for displacement of big game species from NFS lands during the archery and rifle hunting seasons. Possible management actions may vary on a project-specific or local basis, and should be based on the best available scientific information (such as that described in the U.S. Forest Service and Montana Department of Fish, Wildlife and Parks Collaborative Overview and Recommendations for Elk Habitat Management on the Custer, Gallatin, Helena, and Lewis and Clark National Forests, 2013, or subsequent versions). Also see appendix C section titled “Elk and Other Big Game Species.

Benefits to People – Energy and Minerals (EMIN)

Desired Conditions

FW-EMIN-DC-05: The Forest continues to contribute to the economic strength and demands of the nation by supplying mineral and energy resources while assuring that the sustainability and resiliency of other resources are not compromised or degraded.

FW-EMIN-DC-06: Mineral materials are available based upon public interest, material availability, in-service needs, and protection of other resource values, including consistency with desired conditions for other resources.

Guidelines

FW-EMIN-GDL-01: To minimize adverse effects to aquatic and riparian resources, new authorizations and reauthorizations for mineral development and operations should avoid RMZs to the extent

practicable. If the RMZ cannot be avoided, then ensure operators take all practicable measures to maintain, protect, and rehabilitate fish and wildlife habitat that may be affected by the operations. Required bonding should consider (in the estimation of bond amount) the cost of stabilizing, rehabilitating, and reclaiming the area of operations.

FW-EMIN-GDL-02: To minimize adverse effects to aquatic and riparian resources, new authorizations and reauthorizations for mineral development and operations should avoid adverse effects to aquatic and riparian resources. This should include requirements that operators take all practicable measures to maintain, protect, and rehabilitate water quality, and habitat for fish and wildlife and other riparian associated resources which may be affected by the operations.

Big Belts Geographic Area (BB)

Wildlife

Desired Conditions

BB-WL-DC-03: The Big Belts GA provides habitat connectivity for wide ranging species (e.g., grizzly bear and others) between public lands in northern Montana and those in south and southwestern Montana, including lands in the Greater Yellowstone Ecosystem.

Crazies Geographic Area (CR)

Wildlife

Desired Conditions

CR-WL-DC-01: The Crazies GA provides habitat connectivity for wide ranging species (e.g., grizzly bear and others) between public lands in northern Montana and those in south and southwestern Montana, including lands in the Greater Yellowstone Ecosystem.

Divide Geographic Area (DI)

Forested Vegetation

Desired Conditions

DI-VEGF-DC-04: Lynx habitat (see glossary) provides the amount, distribution, and structural conditions (based on the best available scientific information), at the scale of a reproductive female lynx home range, necessary to support the recovery and persistence of Canada lynx in the plan area.

Wildlife

Desired Conditions

DI-WL-DC-01: The Divide landscape provides habitat connectivity for wide-ranging species (grizzly bear, Canada lynx, wolverine, and others) between public lands in northern Montana and those in south and southwestern Montana, including lands in the Greater Yellowstone Ecosystem.

Goals

DI-WL-GO-01: Acquire ownership of or easements on non-NFS lands that are intermingled with or immediately adjacent to NFS lands, for the purpose of ensuring connectivity and security for wildlife species.

Guidelines

DI-WL-GDL-01: In order to maintain or improve wildlife security and connectivity, resource management activities in the central portion of the GA, adjacent to Highway 12, and where private ownerships are intermingled with NFS lands, should maintain or enhance high quality wildlife habitat, wildlife movement areas, and connectivity. In order to improve wildlife security and connectivity in these areas:

- Vegetation management activities should provide for wildlife hiding cover needs.
- Motorized access should not be increased.
- New trails should be constructed only where minimal impacts will occur to wildlife habitats and movement corridors.

South Hills Recreation Area

Desired Conditions

DI-SHRA-DC-01: The area offers dispersed nonmotorized recreation opportunities with high scenic quality within proximity to the city of Helena, Montana. Also see Forestwide Recreation Opportunities, Dispersed Recreation.

Guidelines

DI-SHRA-GDL-01: When conducting vegetation management in the South Hills Recreation Area, projects should be designed to meet desired conditions for vegetation and other resources while emphasizing values such as visitor safety, desirable recreation experiences, improving forest resilience, reducing the risk of high severity wildfire, and reducing hazardous fuels.

Suitability

DI-SHRA-SUIT-01: The South Hills Recreation Area is unsuitable for timber production, although harvest may be conducted to provide for other multiple use values compatible with the recreation values of the area, such as those described in DI-SHRA-GDL-01.

DI-SHRA-SUIT-02: Within the South Hill Recreation Area, mechanized means of transport (such as mountain bikes) are suitable on FS established roads and trails only. No cross-country mountain bike activities would be allowed.

Elkhorns Geographic Area and Wildlife Management Unit (EH)

Wildlife

Desired Conditions

EH-WL-DC-02: The Elkhorns GA provides habitat connectivity for wide ranging species (e.g., grizzly bear and others) between public lands in northern Montana and those in south and southwestern Montana, including lands in the Greater Yellowstone Ecosystem.

Access

Guidelines

EH-ACCESS-GDL-01: Access to authorized routes to private inholdings or valid mining claims should protect wildlife habitat through restrictions on both locations and timing of use.

Roads and Trails

Standards

EH-RT-STD-01: New permanent roads shall be constructed only for alleviating resource concerns (e.g., removing a road from a riparian area and replacing it with a road in another location) or to allow reasonable access to private lands that cannot be accessed except by crossing NFS lands. Permanent roads constructed for these purposes shall include conditions (for example, timing of use restrictions, location restrictions) in order to meet wildlife habitat objectives.

EH-RT-STD-02: A trans-mountain road (bisecting the Elkhorns Mountain Range) shall not be constructed.

Little Belts Geographic Area (LB)

Showdown Ski Area

Desired Conditions

LB-SHOWSKI-DC-01: The Showdown Ski Area provides public access to developed recreation activities such as, but not limited to, downhill skiing, snowboarding, and snowshoeing.

LB-SHOWSKI-DC-02: The vegetation and forest conditions at Showdown Ski Area provide for public health and safety, recreational settings and user experiences, enhanced scenic values, and protection of facilities and infrastructure. Also see FW-VEGT-GDL-01 and FW-VEGF-GDL-02 exceptions.

Rocky Mountain Range Geographic Area (RM)

Forested Vegetation

Desired Conditions

RM-VEGF-DC-04*:* Lynx habitat (see glossary) provides the amount, distribution, and structural conditions (based on the best available scientific information), at the scale of a reproductive female lynx home range, necessary to support the recovery and persistence of Canada lynx in the plan area.

Wildlife

Desired Conditions

RM-WL-DC-01: The Rocky Mountain Range GA provides habitat connectivity for wide-ranging species (grizzly bear, Canada lynx, wolverine, and others) between public lands in northern Montana and those in central and southern Montana, including lands in the Greater Yellowstone Ecosystem.

Standards

RM-WL-STD-01: To avoid potential conflicts with grizzly bears and to avoid risk of disease transmission to wild bighorn sheep, domestic sheep or goat grazing on NFS lands with the Rocky Mountain Range GA will not be permitted.

Teton Pass Ski Area

Desired Conditions

RM-TETONSKI-DC-01: The Teton Pass Ski Area provides public access to developed recreation activities such as, but not limited to, downhill skiing, snowboarding, snowshoeing, and backcountry skiing.

RM-TETONSKI-DC-02: The vegetation and forest conditions at Teton Pass Ski Area provide for public health and safety, recreational settings and user experiences, enhancing scenic values, protection of facilities and infrastructure. Also see FW-VEGF-STD-01.

Rocky Mountain Front Conservation Management Area (CMA)

Desired Conditions

RM-CMA-DC-01: The conservation management area on the Rocky Mountain Front conserves, protects, and enhances the recreational, scenic, historic, cultural, fish, wildlife, roadless, and ecological values of the area for the benefit and enjoyment of present and future generations.

RM-CMA-DC-03: Nonmotorized recreation trail opportunities enable access to the primitive and semiprimitive recreation opportunity spectrum settings within the conservation management area.

Standards

RM-CMA-STD-01: No new or temporary roads shall be constructed within the Rocky Mountain Front Conservation Management Area, except:

- To reroute or close an existing route to protect resources.
- To allow motorized access for timber management activities not more than ¼ mile from Teton Road, South Fork Teton Road, Sun River Road, Beaver Willow Road, or Benchmark Road.
- To allow for administrative access, permitted access, and access to valid existing rights.
- For emergency purposes.

RM-CMA-STD-02: Temporary roads that are constructed for vegetation management projects shall be restored within 3 years of project completion, including site preparation and planning activities.

Snowies Geographic Area (SN)

Grandview Recreation Area

Desired Conditions

SN-GVRA-DC-03: Trails within the Grandview Recreation Area offer dispersed, nonmotorized recreation opportunities. These opportunities range in complexity from those that are easy and readily accessible to those that are more difficult and require greater skills. Also see Forestwide Recreation Opportunities, Dispersed Recreation.

Suitability

SN-GVRA-SUIT-01: The entire Grandview Recreation Area is unsuitable for timber production. The Crystal Lake complex outside of the Big Snowies Wilderness Study Area is suitable for timber harvest to provide for other multiple use values.

SN-GVRA-SUIT-02: Within the Grandview Recreation Area, mechanized means of transportation (such as mountain bikes) are suitable on FS established roads and trails as long as they maintain the wilderness character of the WSA. No cross-country mountain bike activities are allowed.

Upper Blackfoot Geographic Area (UB)

Forested Vegetation

Desired Conditions

UB-VEGF-DC-04: Lynx habitat (see glossary) provides the amount, distribution, and structural conditions (based on the best available scientific information), at the scale of a reproductive female lynx home range, necessary to support the recovery and persistence of Canada lynx in the plan area.

Wildlife

Desired Conditions

UB-WL-DC-01: The Upper Blackfoot GA provides habitat connectivity for wide-ranging species (grizzly bear, Canada lynx, wolverine, and others) between public lands in northern Montana and those in central and southern Montana, including lands in the Greater Yellowstone Ecosystem.

Guidelines

UB-WL-GDL-01: Resource management activities in the west-central and east-central portions of the GA, where NFS lands narrow and approach the area of private lands surrounding Highway 200, should maintain or enhance high quality wildlife habitat, wildlife movement areas, and connectivity. In order to improve wildlife security and connectivity in these areas:

- Vegetation management activities should provide for wildlife hiding cover needs
- Motorized access should not be increased
- New trails should be constructed only where minimal impacts will occur to wildlife habitats and movement corridors

Northern Rockies Lynx Management Direction (NRMLD) Record of Decision

This document and associated guidance is incorporated in its entirety in the 2020 Forest Plan as Appendix F. For reference, it is provided as Appendix B of this BA, below.

Appendix B. Record of Consultation with the U.S. Fish and Wildlife Service

Date	Consultation
8 June 2018	Notice of Availability for the HLC NF Draft Revised Forest Plan and Draft Environmental Impact Statement published in the Federal Register
Fall 2018	Informal meeting with FWS in Helena to discuss upcoming consultation, process, personnel, etc.
October 2018	Letter sent to MT Field Office Supervisor from FS requesting a meeting to discuss personnel, procedures, and other consultation-related items
December 2018 – February 2019	Emails and phone calls to schedule meeting to establish consultation process, personnel and timeline (interrupted by federal government shutdown)
26 February 2019	Meeting (Helena FS office, with some FS personnel on phone) to discuss agenda items outlined in October letter and delays caused by federal government shutdown
26 March 2019	Phone call with K Dixon (FWS), W Clark, D Kemp, and J Dumont (all FS). Discussion of BA format and content for grizzly bear, lynx, and whitbark pine.
2 August 2019	Rough draft of grizzly bear portion of BA sent to Katrina Dixon by Wendy Clark
16 August 2019	W Clark emailed updated DRAFT of BA info/intro and grizzly bear section to K Dixon for review
04 September 2019	Telephone conversation between W Clark and K Dixon regarding draft sent 16 August. Discussion about information for baseline and potential consequences of different analysis approaches.
05 September 2019	Email from K Dixon to W Clark with written comments on draft BA grizzly bear section as discussed on 4 September
19 September 2019	Email sent to K Dixon by W Clark, suggesting small group discussion of approaches to grizzly bear baseline in Zones 2 and 3.
25 September 2019	Meeting in Helena with W Clark, D Entwistle, C Keckler (all FS), and K Dixon, J Bush (FWS) in person and B Conard (FWS, L Allen and C Savage (FS) on phone. Discussion of approaches to grizzly bear baseline, particularly in Zones 2 and 3.
October 2019	Meeting in Helena with B Avey (FS) and J Bush (FWS) regarding approach to grizzly bear baseline in Zone 2 and 3
22 October 2019	Draft Canada lynx and lynx critical habitat assessment sent to K Dixon by W Clark via email
13 December 2019	Second draft Canada lynx and lynx critical habitat assessment sent to K Dixon by D Kemp via email
6 December 2019	Forest/Pod Level 1 consultation meeting. Additional details regarding grizzly bear analysis discussed among W Clark, D Pengeroth (both FS), K Dixon and T Olenicki (both FWS).
20 December 2019	Draft of revised grizzly bear secure habitat analysis section of assessment emailed by W Clark to K Dixon requesting review
13 January 2020	Final list of federally listed species for HLC NF accessed by W Clark from FWS site: https://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species/Forests/Helena-L&C_sp_list.pdf
29 January 2020	Email from K Dixon to W Clark with comments on draft grizzly bear secure habitat analysis section
10 February 2020	Meeting between D.Pengeroth (FS) and K. Dixon (FWS) at FWS office to discuss additional information needed on grizzly bear questions.
9 March 2020	Forest Service submits to the Fish and Wildlife Service the Biological Assessment for Threatened, Endangered and Proposed Species: Revised Land and Resource Management Plan for the Helena – Lewis and Clark National Forest

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Appendix C. Northern Rockies Lynx Management Direction (NRMLD) – Record of Decision 2007

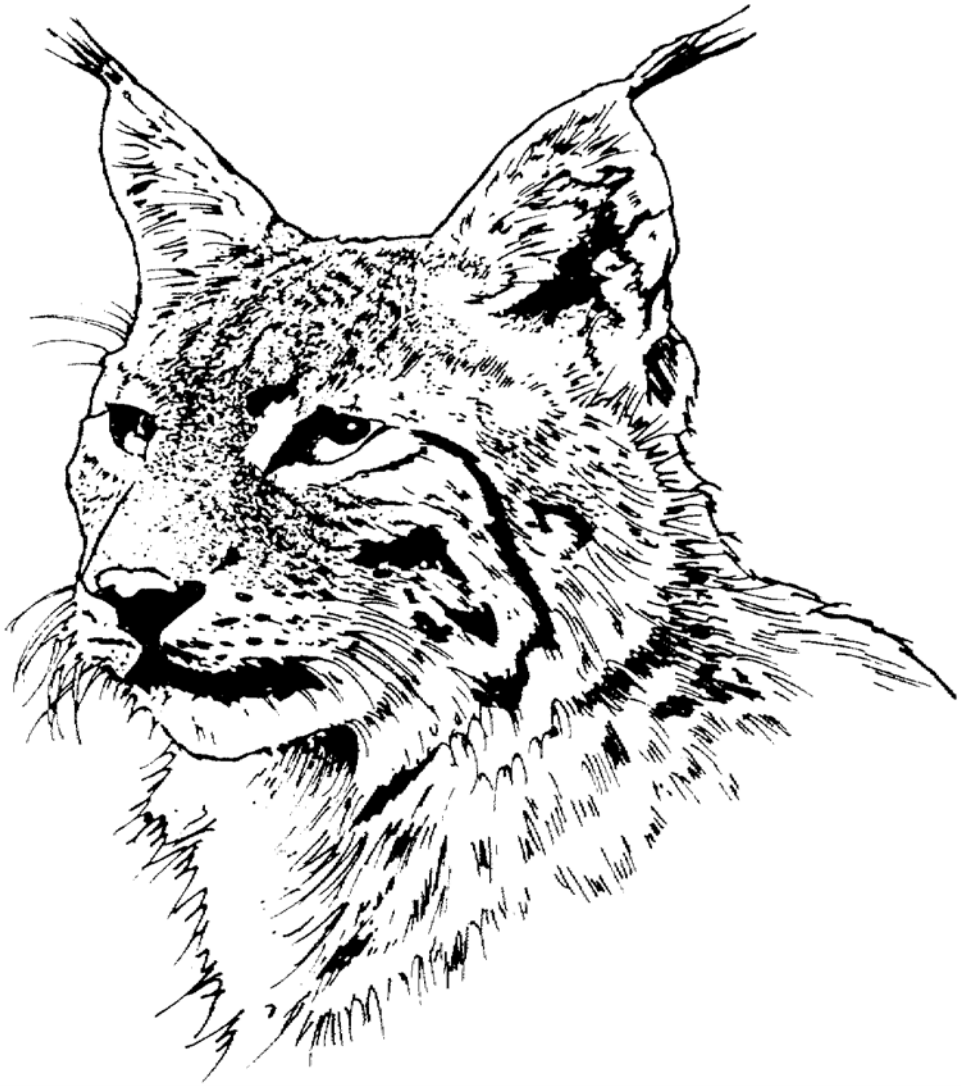
The 2020 Forest Plan retains the decision for managing Canada lynx habitat from the 2007 Northern Rockies Lynx Management Direction (NRLMD) Record of Decision. The 2020 Forest Plan carries forward the objectives, standards, and guidelines that were developed to conserve the Canada lynx. The use of the terms "standards," and "guidelines" in the NRLMD is consistent with the definitions of these terms found in the 2020 Forest Plan. The definition of "objectives" in the NRLMD is consistent with the definition of "desired conditions" found in the 2020 Forest Plan. The 2020 Forest Plan thus defines the NRLMD "objectives" as "desired conditions." The NRLMD in this appendix is incorporated in the 2020 Forest Plan in its entirety, to include required monitoring both part of the NRLMD and those terms and conditions that were incorporated from the US FWS Biological Opinion on the NRLMD (USDI FWS 2007). Projects and activities must be consistent with the NRLMD ROD and 2020 Forest Plan.

USDA
Forest
Service

National Forests in
Montana, and parts of
Idaho, Wyoming, and
Utah

March 2007

Northern Rockies Lynx Management Direction Record of Decision



Record of Decision

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Summary of the decision

We have selected Alternative F, Scenario 2 as described in the Northern Rockies Lynx Management Direction Final Environmental Impact Statement (FEIS) (pp. 35 to 40), with modifications. We modified Alternative F, Scenario 2 and incorporated the U.S. Fish and Wildlife Service (FWS) Terms and Conditions (USDI FWS 2007), where applicable, into the management direction – see Attachment 1- hereafter called the *selected alternative*. We determined the selected alternative provides direction that contributes to conservation and recovery of Canada lynx in the Northern Rockies ecosystem, meets the Purpose and Need, responds to public concerns, and is consistent with applicable laws and policies. In the FEIS we analyzed six alternatives in detail and two scenarios for Alternative F. Of those, we determined Alternative F Scenario 2 is the best choice. With this decision, we are incorporating the goal, objectives, standards, and guidelines of the selected alternative into the existing plans of all National Forests in the Northern Rockies Lynx Planning Area – see Figure 1-1, FEIS, Vol. 1 Tables 1-1 and 1-2.

The direction applies to mapped lynx habitat on National Forest System land presently **occupied** by Canada lynx, as defined by the *Amended Lynx Conservation Agreement between the Forest Service and the FWS* (USDA FS and USDI FWS 2006). When National Forests are designing management actions in **unoccupied** mapped lynx habitat they should consider the lynx direction, especially the direction regarding linkage habitat. If and when those National Forest System lands become occupied, based upon criteria and evidence described in the Conservation Agreement, the direction shall then be applied to those forests. If a conflict exists between this management direction and an existing plan, the more restrictive direction will apply.

The detailed rationale for our decision, found further in this document, explains how the selected alternative best meets our decision criteria. Those decision criteria are: 1) meeting the Purpose and Need to provide management direction that conserves and promotes the recovery of Canada lynx while preserving the overall multiple use direction in existing plans; 2) responding to the issues; and 3) responding to public concerns.

Background

The FWS listed Canada lynx as a threatened species in March 2000, saying the main threat was "the lack of guidance for conservation of lynx and snowshoe hare habitat in National Forest Land and Resource Plans and BLM Land Use Plans" (USDI FWS 2000a). Following the listing, the Forest Service (FS) signed a Lynx Conservation Agreement with the FWS in 2001 to consider the Lynx Conservation Assessment and Strategy (LCAS) during project analysis, and the FS agreed to not proceed with projects that would be "likely to adversely affect" lynx until the plans were amended. The Conservation Agreement (CA) was renewed in 2005 and added the concept of occupied mapped lynx habitat. In 2006 the CA was amended to define occupied habitat and to

list those National Forests that were occupied. In 2006 it was also extended for 5 years (until 2011), or until all relevant forest plans were revised to provide guidance necessary to conserve lynx (USDA FS and USDI FWS 2000, 2005, 2006a, 2006b). The plan direction in this decision fulfills our agreement to amend the plans. The management direction provided in this decision is based upon the science and recommendations in:

- *Ecology and Conservation of Lynx in the United States* (Ruggiero et al 2000), which summarizes lynx ecology;
- *Lynx Conservation Assessment and Strategy* (LCAS) (Ruediger et al 2000), which recommends conservation measures for activities that could place lynx at risk by altering their habitat or reducing their prey; and
- Numerous publications cited in the FEIS and found listed in the *References* section of this ROD and in the FEIS, pp. 381 to 396.

Purpose of and Need for action

The Purpose and Need is to incorporate management direction in land management plans that conserves and promotes recovery of Canada lynx, by reducing or eliminating adverse effects from land management activities on National Forest System lands, while preserving the overall multiple-use direction in existing plans (FEIS, Vol. p. 1).

Risks to lynx and lynx habitat

The overall goals of the LCAS were to recommend lynx conservation measures, provide a basis for reviewing the adequacy of Forest Service land and resource management plans with regard to lynx conservation, and to facilitate section 7 conferencing and consultation under ESA. The LCAS identified a variety of possible risks to lynx and lynx habitat.

The LCAS identified *risk factors affecting lynx productivity* (pp. 2-2 to 2-15) as:

- Timber management
- Wildland fire management
- Livestock grazing
- Recreational uses
- Forest backcountry roads and trails
- Other human developments

These are the typical types of activities conducted on federal land administered by the FS, and the FS has the authority to manage and regulate them. As such, the management direction analyzed in the Lynx FEIS and incorporated into the forest plans with this Record of Decision (ROD) focus on these types of activities.

The LCAS identified *risk factors affecting mortality* (pp. 2-15 to 2-17) as:

- Trapping
- Shooting
- Predator control
- Highways
- Predation by other species

These factors can directly cause lynx deaths. Trapping of lynx is no longer permitted in the planning area, although incidental trapping of lynx could still occur. Incidental or illegal shooting can also occur, but trapping and hunting is regulated by state agencies. Predator control activities are conducted by USDA Wildlife Services. Since the factors of trapping shooting and predator control are outside the authority of the FS to manage or regulate, this ROD does not include management direction related to them.

Highways (generally high-speed, two lane) are a known source of direct mortality (LCAS, pp. 2-16 to 2-17). Depending on the situation, this risk factor may fall under the authority of the FS. Therefore, it is addressed in the FEIS, and management direction concerning highways is incorporated into the Forest Plans through this ROD.

Other predators may affect lynx. Lynx have a competitive advantage in places where deep, soft snow tends to exclude predators in mid-winter, the time when prey is most limiting. Certain activities, such as certain types of winter recreation, may provide access to other predators (LCAS, pp. 2-6 to 2-15). The FEIS and ROD addresses this concern.

The LCAS identified *risk factors affecting movement* (pp. 2-17 to 2-19) as:

- Highways and associated development
- Private land development

Lynx are known to disperse over wide areas. Highways and the developments associated with them may affect lynx movement (LCAS, p. 2-17). The FS has only limited authority to address highways, and has no authority to manage activities on private land. Based on the limited authority the FS has in this area, only a few guidelines address these risk factors.

After the LCAS was issued the FWS published a Clarification of Findings in the *Federal Register* (FEIS, Vol. 1, Appendix P), commonly referred to as the Remand Notice. In the Remand Notice the FWS states, "We found no evidence that some activities, such as forest roads, pose a threat to lynx. Some of the activities suggested, such as mining and grazing, were not specifically addressed [in the Remand Notice] because we have no information to indicate they pose threats to lynx" (p. 40083). Further on in the Remand Notice they state, "Because no evidence has been provided that packed snowtrails facilitate competition to a level that negatively affects lynx, we do not consider packed snowtrails to be a threat to lynx at this time" (p. 40098). In regards to timber harvest the FWS states, "Timber harvesting can be beneficial, benign, or detrimental to lynx depending on harvest methods, spatial and temporal specifications, and the inherent vegetation potential of the site. Forest practices in lynx habitat that result in or retain a dense understory provide good snowshoe hare habitat that in turn provides good foraging habitat for lynx" (p. 40083). These findings by FWS narrow the focus from the concerns first published in the LCAS (discussed above) about what management direction is needed to maintain or improve Canada lynx habitat. We considered this information in the development of the selected alternative, and in our decision.

Public involvement

We involved the public in the development of the plan direction from the very beginning. In order to determine the scope of the public's interest in developing lynx direction the FS and BLM started with a notice published in the *Federal Register* (Vol. 66, No. 176, pp. 47160 to 47163) on September 11, 2001. Originally, the scoping period was scheduled to end on October 26, 2001, but we extended it to December 10, 2001. The FS and BLM gave people more time to comment, both in response to several requests for extensions, and because of the general disruption stemming from the September 11th terrorist attacks. In December 2006, the BLM elected to not be a cooperating agency in this planning effort and to undertake changes to BLM plans through a separate planning process.

We created an official website at www.fs.fed.us/r1/planning/lynx.html. The website continues to provide information, including the information used to develop the Proposed Action, the DEIS, and FEIS.

During scoping we held numerous open-house meetings to provide a better understanding of the lynx proposal and to gain an understanding of public issues and concerns (FEIS, Vol. 1, p. 18). We mailed out more than 6,000 letters about the proposal and upcoming meetings to a mailing list of people interested in land management issues. By December 17, 2001 we had received 1,890 public responses to the scoping notice. We then evaluated and summarized those responses in a report entitled *Summary of Public Comments* (see the *Scoping* section of the Project Record). Responses received after December 17, 2001, but before the release of the Draft Environmental Impact Statement (DEIS) in January 2004 were also considered. A summary of these comments can also be found in the *Scoping* section of the Project Record. In mid-May 2002 we mailed an eight-page update to the more than 2,000 addresses of those who responded to the scoping notice.

We decided to prepare an EIS because of the level of interest expressed during scoping. On August 15, 2002, we published a Notice of Intent to prepare an Environmental Impact Statement in the *Federal Register* (Vol. 67, No. 158, pp. 53334 to 53335). There were five responses to the Notice of Intent, which we also considered.

On January 16, 2004, a Notice of Availability of the DEIS was published in the *Federal Register* (Vol. 69, No. 11, p. 2619). This notice began a 90-day public comment period. At that time, we sent copies of the DEIS (either paper or CD versions), or the summary of the DEIS to a variety of interested parties (FEIS, Vol. 1 p 19). The documents are also available on the web site: www.fs.fed.us/r1/planning/lynx.html.

We hosted open-house meetings in February and March of 2004 to provide the public with a better understanding of the DEIS and its alternatives. Over 380 people attended the open houses which were held in four states and 25 communities. We accepted public comments on the DEIS either sent through the mail or via E-mail. The public comment period ended on April 15, 2004, with the agency receiving well over 5,000

comments. We used those comments, as well as late comments, to help formulate Alternative F, to help clarify and add to the analysis, to correct errors in the DEIS, and to update the FEIS. We responded to all of the comments on the DEIS in the Response to Comments (FEIS, Vol. 2).

Issues

As a result of the public participation process; review by other federal, state, tribal, and local government agencies; and internal reviews, we identified five primary issues, which are described in detail in the FEIS, Vol. 1, Chapter 2. The issues were used as a basis for developing the management direction in the alternatives, and were used to analyze effects. The issues are:

1. Over-the-snow recreation. The effects of limiting the growth of designated over-the-snow routes on opportunities for over-the-snow recreation.

2. Wildland fire risk. The effects of the management direction on the risks to communities from wildland fire.

3. Winter snowshoe hare habitat in multistoried forests. The effect on lynx of allowing projects in winter snowshoe hare habitat in multistoried forests.

4. Precommercial thinning. The effects of limiting precommercial thinning on restoring tree species and forest structures that are declining.

5. FWS Remand decision. The appropriate level of management direction applied to activities that the FWS remand notice found were not a threat to lynx populations.

Alternatives considered in detail

Alternative A, the No Action Alternative. Analyzing a no-action alternative is a requirement of NEPA at 40 CFR 1508.14(d), and of FS planning procedures. The analysis of the effects of Alternative A in the FEIS considers the effects of the forest plans as they currently exist, including any previous amendments. In this case, "no action" means no amendment to the already existing plans, and no additional specific direction to conserve Canada lynx. While the FS has been following the Conservation Agreements signed with the FWS and has considered the LCAS when evaluating projects, the LCAS measures have not been incorporated as plan direction. A decision to adopt Alternative A would not adopt the measures of the LCAS into the plans, but also would not void the existing Conservation Agreements or the consultation requirements of ESA. A decision to not adopt some of the lynx management direction in any of the action alternatives would have been a decision to select a part of Alternative A.

Alternative B, the Proposed Action. The Proposed Action was developed from conservation measures recommended in the LCAS. (See Appendix A in the FEIS, pp. 401 to 438 for a crosswalk from the LCAS, to the proposal as written in the scoping letter; the Proposed Action, Alternative B, found in the Draft and Final EISs; and

Alternative F in the FEIS.) Alternative B addresses activities on National Forest System lands that can affect lynx and their habitat. The exact language of the goal, objectives, standards, and guidelines for Alternative B and all the other action alternatives can be found in the FEIS (Table 2-1, pp. 41 to 69).

Alternative C. Alternative C was designed to respond to issues of over-the-snow recreation management and foraging habitat in multistoried forests, while providing a level of protection to lynx comparable to Alternative B, the Proposed Action. Alternative C would add direction to the plans similar to the LCAS, but would have fewer restrictions on new over-the-snow trails and more restrictions on management actions in winter snowshoe hare habitat in multistoried forests. The exact language of the goal, objectives, standards, and guidelines for Alternative C and all the other action alternatives can be found in the FEIS (Table 2-1, pp. 41 to 69).

Alternative D. Alternative D was designed to address the issues of managing over-the-snow recreation and multistoried forests, similar to Alternative C. Alternative D also allows some precommercial thinning in winter snowshoe hare habitat, while still contributing to lynx conservation. Alternative D would add direction to the plans similar to the LCAS, but having fewer restrictions on new over-the-snow trails and precommercial thinning, and more restrictions than the LCAS (Alternative B) on management actions in winter snowshoe hare habitat in multistoried forests, but less than Alternative C. The exact language of the goal, objectives, standards, and guidelines for Alternative D and all the other action alternatives can be found in the FEIS (Table 2-1, pp. 41 to 69).

Alternative E, the DEIS preferred alternative. Alternative E addresses the issue of wildland fire risk while contributing to lynx conservation. It also responds to statements made in the Remand Notice (USDI FWS, 2003) that FWS has no information to indicate grazing or snow compaction are threats to lynx at this time. This was done by changing the grazing and human uses standards to guidelines. Alternative E would add direction to the plans similar to the LCAS, but has fewer restrictions on new over-the-snow trails and on fuel reduction projects proposed in a collaborative manner, and more restrictions on management actions in winter snowshoe hare habitat in multistoried forests. The exact language of the goal, objectives, standards, and guidelines for Alternative E and all the other action alternatives can be found in FEIS (Table 2-1, pp. 41 to 69).

Alternative F, the FEIS preferred alternative. Alternative F was developed from public comments on the DEIS and by pulling together parts of the other alternatives. Since it was developed from the other alternatives, the effects of Alternative F is within the scope of the effects of the alternatives analyzed in the DEIS.

Alternative F addresses many comments about problems and concerns with Alternatives E, the DEIS preferred alternative. In particular many people and FWS felt Alternative E would not meet the purpose and need because it did not provide the

regulatory mechanisms to adequately address lynx needs. Alternative F was designed to provide adequate regulatory mechanisms for those risk factors found to be a threat to lynx populations – specifically those factors related to the quantity and quality of lynx habitat as discussed in the FEIS, Vol. 1, section *Management direction considered*.

Alternative F addresses comments about where to apply the management direction. Many comments suggested the management direction should only be applied to occupied habitat. Therefore, Alternative F is evaluated under two scenarios: (1) management direction would be incorporated into all forest plans and would *apply to all mapped lynx habitat*, whether or not occupied; and (2) management direction would be incorporated into all forest plans but would only *apply to occupied habitat.* Under Scenario 2, the direction should be "considered" for unoccupied units, but would not have to be followed until such time as lynx occupy the unit. The Nez Perce, Salmon-Challis, Beaverhead-Deerlodge, Bitterroot, Ashley, and Bighorn NFs, and the disjunct mountain ranges on the Custer, Gallatin, Helena, and Lewis and Clark NFs are unoccupied based on the best scientific information available at this time (USDA FS, USDI FWS 2006a).

Other management direction considered

Comments on the DEIS identified a variety of suggestions for management direction. Some of the suggestions were incorporated into the selected alternative, others were not. The FEIS, Vol. 1 pp. 71-102 provides a thorough discussion of these comments and our considerations. The following section includes discussion of some these comments and how they were considered, but not all of the suggestions considered.

The decision

The management direction in Alternative F, Scenario 2 modified (referred from now on as the *selected alternative,* see - Attachment 1) is amended into all Forest Plans in the planning area. The management direction incorporates the terms and conditions FWS issued in their biological opinion (USDI FWS 2007). This management direction includes a goal, objectives, standards, and guidelines related to all activities (ALL), vegetation management (VEG), grazing management (GRAZ), human uses (HU), and linkage (LINK). *Goals* are general descriptions of desired results; *objectives* are descriptions of desired resource conditions; *standards* are management requirements designed to meet the objectives; and *guidelines* are management actions normally taken to meet objectives. Guidelines provide information and guidance for project and activity decision-making (FEIS, Vol. 1 p. 8). The Forest Service and FWS developed the selected alternative in a collaborative manner (Project File/Coordination/with FWS, and Project File/Alternatives/FEIS alternatives).

The selected alternative provides a balance of meeting the purpose and need, and addressing the five primary issues, including other public comments. Alternative B does not provide the management direction necessary for winter snowshoe hare habitat

in multistoried forests. Alternative C, may be best for lynx, but does not address any other issues. Alternative D addresses the need to restore tree species in decline, but we have determined it may allow too much activity in winter snowshoe hare habitat and result in more extensive adverse effects. Alternative E address wildfire risk to communities, but based on our analysis and comments from FWS and the public, may not provide the necessary direction to contribute to conservation and recovery of lynx.

We determined, through our analysis and with concurrence from FWS, the selected alternative contributes to conservation and recovery of lynx, while allowing some activities to occur in lynx habitat that may have some adverse effects on lynx. We determined it was important and acceptable to restore tree species in decline and address wildland fire risks to communities. This decision allows some possible adverse effects on 6.5 percent of lynx habitat (through a combination of fuels treatment in the wildland urban interface (WUI) and precommercial thinning). However, all vegetative standards remain applicable to 93.5 percent of lynx habitat.

The following describes the risk factors, what the LCAS proposed (Alternative B), issues related to the proposed action, what Alternative E (the DEIS preferred alternative) included, comments we received on the DEIS, consideration of new information, and finally what was incorporated into the selected alternative and why.

Management direction related to vegetation

Lynx require certain habitat elements to persist in a given area. Lynx productivity is highly dependent on the quantity and quality of winter snowshoe hare habitat. Winter snowshoe hare habitat may be found in dense young regenerating forests – where the trees protrude above the snowline and in multistoried forests where limbs of the overstory touch the snowline, in addition to shorter understory trees that provide horizontal cover. Certain activities, such as timber harvest, prescribed burning and wildfires, can affect the amount and distribution of these habitat elements, which can in turn affect lynx productivity. Timber harvest can be beneficial, benign, or detrimental depending on the harvest method, the spatial and temporal occurrence on the landscape and the inherent vegetation potential of the site (FEIS, Vol. 1, Appendix P).

Objectives for vegetation management

Objectives define desired conditions for lynx habitat. The LCAS identified four primary objectives which are reflected in Alternative B as *Objectives VEG O1, VEG O2, VEG O3, and VEG O4*. These objectives essentially remain the same among all alternatives. Objectives VEG O1, VEG O2 and VEG O4 were clarified in the selected alternative based on comments on the DEIS, but their intent is the same as the in LCAS.

Standards and guidelines relating to quantity of winter snowshoe hare habitat

Standard VEG S1. In order to provide a distribution of age classes, the LCAS recommended that an lynx analysis unit (LAU) (an area the size of a female lynx home range) not have more than 30 percent of the lynx habitat in an unsuitable condition, and

if an LAU was at 30 percent then vegetation management projects should not create more. Lynx habitat in an unsuitable condition includes those forests in a stand initiation structural stage that are too short to provide winter snowshoe hare habitat. These conditions are created by stand-replacing wildfires, prescribed burns that remove all of the vegetation, or regeneration timber harvest. This recommendation is reflected in Alternative B *Standard VEG S1*.

Some people felt the 30 percent criterion was too high and others said it was too low based on how fires burn in lynx habitat. In addition, some people felt that constraining the 30 percent criterion to a single LAU was too restrictive, as fires burn across vast areas. Fire is the most common disturbance in lynx habitat. Generally, large stand replacing fires burn every 40 to 200 years and smaller low intensity fires burn in the intervals between stand replacing fires (FEIS, Vol. 1, p. 72 and 213-214). The 30 percent criterion was based on a way to maintain lynx habitat over time (Brittel et al. 1989).

None of the alternatives change the 30 percent criterion. However, Alternatives C, D, and E change the area the standard would be considered from an LAU to a larger landscape. Alternatives C and E apply the standard to an LAU or in a combination of immediately adjacent LAUs; Alternative D applies the standard to a subbasin or isolated mountain range. Some people liked the idea of applying the standard to a larger area, others did not. In their comments on the DEIS FWS recommended the standard be applied to a single LAU in order to maintain a good distribution of lynx habitat at the scale of a lynx home range.

The selected alternative applies the management direction to a single LAU to ensure a variety of structural stages are provided within the home range. In addition, the selected alternative was reworded to clarify what "unsuitable habitat" entails and what types of vegetation projects create this condition.

Standard VEG S2. The LCAS also recommended that timber harvest not change more than 15 percent of lynx habitat to an unsuitable condition (stand initiation structural stage that is too short to provide for winter snowshoe hare habitat) over a decade. The purpose of this standard was to limit the rate of management induced change in lynx habitat (FEIS p. 74). This recommendation is reflected in Alternative B *Standard VEG S2.*

In 2003, the effect timber harvest historically had on creating "unsuitable habitat" on Forest Service lands in Region 1 (Hillis et al. 2003) was analyzed. The analysis was based on hydrologic unit codes (HUC) (similar to the size of a lynx home range). This analysis found only 2.5 percent of the HUCs exceeds the 15 percent criterion. Since this criterion was rarely exceeded in the past, and the amount of regeneration harvest the agency does now has been dramatically reduced over the past decade (Project File/Analysis/Vegetation/FEIS/Data), Standard VEG S2 was changed to Guideline VEG G6 in Alternative C, and dropped as a standard or guideline in Alternatives D and E.

FWS comments on the DEIS said that dropping Standard VEG S2 could allow potentially negative effects to lynx to accumulate. Removal of the standard could result in reducing the amount of lynx habitat over a short period of time. Based on these comments, Standard VEG S2 was included in the selected alternative. In addition, the standard was reworded to clarify that it only applies to timber management practices that regenerate a forest (clearcut, seed tree, shelterwood, group selection).

Guideline VEG G1. The LCAS also recommended creating forage (winter snowshoe hare habitat) where it was lacking. *This is reflected as Guideline VEG G1 in Alternative B*. This guideline is retained in the selected alternative. The wording clarifies that the priority areas for creating forage should be in those forests that are in the stem-exclusion, closed canopy structural stage to enhance habitat conditions for lynx and their prey. Basically it says we should focus regeneration efforts in pure lodgepole stands, with little understory, especially where forage is lacking.

Other related comments. Other comments we received on the DEIS relating to the amount or spatial distribution of winter snowshoe hare habitat were in regards to including a standard to limit type conversion, and limiting the size of clearcuts and other regeneration harvest units (FEIS Vol. 1 p. 75-76 and FEIS Vol. 2 27-27, 56-57, 59-60). Neither of these standards were recommended in the LCAS.

Objectives VEG O1, VEG O2, VEG O3 and VEG O4 describe the desired conditions of lynx habitat and all are consistent with the intent to minimize habitat conversions. Projects and activities should be designed to meet or move towards objectives; therefore a standard for type conversion was not necessary.

Openings created by even-aged harvest are normally 40 acres or less. Creating larger openings requires 60-day public review and Regional Forester approval, with some exceptions (R1 Supplement Forest Service Handbook 2400-2001-2; R2 Supplement 2400-99-2). Koehler (1990) speculated that openings created by regeneration harvest, where the distance-to-cover was greater than 325 feet, might restrict lynx movement and use patterns until the forest re-grows. While it is assumed lynx would prefer to travel where there is forested cover, the literature contains many examples of lynx crossing unforested openings (Roe et al. 2000).

Larger openings can often more closely resemble vegetative patterns similar to natural disturbance events (e.g. fire, windthrow, and insect outbreaks) (FEIS, Vol. 1, Appendix P). A disturbance pattern characterized by a few large blocks may be desirable if large areas of forested habitat are a management goal, or if the predation and competition that occur at the edges between vegetation types is a problem (Ruggiero et al. 2000, p. 431). While it is true lynx may not use large openings initially, once they have re-grown and can provide cover, generally after ten to 30 years, such areas may be important to lynx (FEIS, Vol. 1, Appendix P, p. 40092).

The selected alternative already contains direction to consider natural disturbances and maintain habitat connectivity. Based on this management direction and evaluating the information in the *Ecology and Conservation of Lynx in the United States* (Ruggiero et al. 2000) and the LCAS, we decided that a standard limiting the size of openings was unnecessary to improve lynx conservation.

Standards and guidelines relating to quality of winter snowshoe hare habitat

Snowshoe hare are the primary prey for lynx. Winter snowshoe hare habitat is a limiting factor for lynx persistence. Snowshoe hare habitat consists of forests where young trees or shrubs grow densely. In addition to dense young regenerating forests, multistory forests that have trees whose limbs come down to snow level and have an abundance of trees in the understory, also provide winter snowshoe hare habitat. During winter, hare forage is limited to twigs and stems that protrude above the snow and the hares can reach. The LCAS recommended management direction to address winter snowshoe hare habitat in relation to precommercial thinning. Alternative B, the proposed action, splits the management direction to address actions occurring in winter snowshoe hare habitat in young regenerating forests (Standard VEG S5) and actions occurring in winter snowshoe hare habitat found in multistory forests (Standard VEG S6).

Standard VEG S5. The LCAS recommended no precommercial thinning that reduces winter snowshoe hare habitat in the *stand initiation structural stage*. This is reflected in Alternative B *Standard VEG S5.* Precommercial thinning within 200 feet of administrative sites, dwellings, or outbuildings has been allowed under current practices because it was found to have no effect to lynx due to location near structures.

Some people said this standard should apply to all vegetation management projects, not just precommercial thinning. Precommercial thinning is the primary activity that occurs in young regenerating forests. On occasion, other activities such as fuel treatments or prescribe burning, could occur. Alternatives C and D were expanded to apply to all vegetation management projects. Alternative E, the DEIS preferred alternative, only applied it to precommercial thinning projects.

Only a few comments were received on the DEIS saying the standard should apply to all type of projects. FWS did not comment on the more narrow application of the standard.

Standard VEG S5 in the selected alternative only applies to precommercial thinning because it is the predominate activity in young regenerating forests and it is has been identified as the risk factor for reducing winter snowshoe hare habitat (LCAS, Ruggiero et al. 2000, USDA FS and USDI BLM 2000, USDI FWS 2000a, 2000b, USDI FWS 2003).

As noted earlier in the issues section, some people said precommercial thinning should be allowed to restore tree species in decline or to encourage future large trees. Alternative D addresses this issue by allowing precommercial thinning of planted

western white pine, whitebark pine, aspen, and larch, ponderosa pine, and lodgepole pine in certain situations. Alternative E, the DEIS preferred alternative, only allowed precommercial thinning adjacent to structures, for research or genetic tests, or for fuel treatment projects identified in a collaborative manner.

Several comments on the DEIS said the allowances for precommercial thinning in Alternative D should be incorporated into the final alternative. Several comments said that some allowance for adaptive management should be incorporated and that thinning should be allowed where it could be done to promote or prolong winter snowshoe hare habitat.

FWS comments on the DEIS said thinning adjacent to administrative sites, dwellings, or outbuildings and for research and genetic tests would have little effect on lynx or their habitat. In addition, they said the following thinning activities would have cumulatively little effect upon lynx habitat and, in some cases, advance natural ecological conditions. These include: (1) daylight thinning of planted rust-resistant western white pine where 80 percent of winter snowshoe hare habitat is maintained; (2) thinning within whitebark pine stands; (3) western white pine pruning; and (4) thinning for Christmas trees.

We evaluated the comments and incorporated the following elements into the selected alternative:

- Since Standard VEG S5 is concerned with reduction of winter snowshoe hare habitat, western white pine pruning and thinning for Christmas trees can occur if winter snowshoe hare habitat is not reduced. Generally these activities are done on an individual tree basis and do not change the characteristics of the habitat.
- Precommercial thinning can be done adjacent to administrative sites, dwellings, or outbuildings and for research and genetic tests since these would have benign effects on lynx.
- Precommercial thinning can be done for planted rust-resistant western white pine, whitebark pine, and aspen. Thinning to enhance whitebark pine and aspen would benefit other wildlife species and effects only limited acres in lynx habitat (FEIS, Vol. 1 Lynx section). Daylight thinning will be allowed around individual planted rust-resistant western white pine where 80 percent of the winter snowshoe hare habitat is retained. This may reduce some habitat effectiveness, but since this tree species has declined 95 percent across its range, we determined it was important to allow a limited amount of thinning to retain the species on the landscape.

Under these exceptions, about 64,000 acres could be precommercial thinned in occupied lynx habitat over the next decade – assuming full funding. This is likely to affect less than 2 percent of winter snowshoe hare habitat (FEIS Vol. 1 p. 188, USDI FWS 2007).

We also considered allowing precommercial thinning in vast areas of young regenerating forests where precommercial thinning could be done to prolong winter snowshoe hare habitat. We also considered precommercial thinning in young regenerating forests composed primarily of western larch with more than 10,000 trees

per acre – where larch would be removed to favor other species that provide better winter snowshoe hare habitat. In both these situations the general belief is that these activities may be beneficial to lynx in the long term, but information is not available at this time to support that hypothesis. So, the standard was modified to provide an avenue to consider new information that may in the future prove or disprove these hypotheses. The criterion provided in the selected alternative states:

Based on new information that is peer reviewed and accepted by the regional level of the Forest Service and the 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.

This criterion allows incorporation of new peer reviewed information, but requires agreement by FWS before it may be utilized.

Standard VEG S6. The LCAS recommended no precommercial thinning that reduces *winter snowshoe hare habitat in multistory forests*. This is reflected in Alternative B *Standard VEG S6.* Precommercial thinning within 200 feet of administrative sites, dwellings or outbuildings has been allowed under current practices because it was found to have no effect to lynx due to location near structures. The LCAS did not contain a recommendation related to other management actions.

As noted in Issue #3 some people said the management direction should preclude all activities that reduce winter snowshoe hare habitat in multistory forest. Alternatives C, D, and F would apply the management direction to all vegetation management activities in multistory forests that provide winter snowshoe hare habitat. Each alternative has different allowances for vegetation management. Alternative E, the DEIS preferred alternative, changed the management direction from a standard to Guideline VEG G8. The intent of the guideline was to direct vegetation projects to provide winter snowshoe hare habitat through time.

Multistory forest structures can develop from natural processes, such as insects and diseases and fire, or management actions like timber harvest that create small openings where trees and shrubs can grow.

Comments on the DEIS suggested that management direction for multistory forests should be in the form of a standard. FWS suggested the agencies review the latest information or research on lynx use of forests in multistoried structural stages prior to developing a final preferred alternative.

Recent research in northwest Montana demonstrates that mature multistoried forests provide important winter snowshoe hare habitat and are more important than younger stands (FEIS, Vol. 1, p. 22). In fact, the researchers questioned whether or not the LCAS would provide for lynx viability and recovery if only precommercial thinning were precluded.

Based on this new information we retained Standard VEG S6 in the selected alternative, but we preclude *all* vegetation management activities that reduce winter snowshoe hare habitat in multistory forests, not just precommercial thinning as recommended in the LCAS. We would allow minor reductions in winter snowshoe hare habitat for activities within 200 feet of structures, research or genetic tests, and for incidental removal during salvage harvest (associated with skid trails). Fuel treatment projects within the WUI are also exempt from this standard (see fuel treatment discussion further in this decision). We also allow timber harvest in areas that have the potential to improve winter snowshoe hare habitat but presently have poorly developed understories.

We believe and FWS concurred that protecting winter snowshoe hare habitat in multistoried forests will further retain and promote important lynx habitat components.

Standards and guidelines relating to denning habitat

Woody debris – piles of wind-thrown trees, root wads, or large down trees – provides lynx denning sites. Large woody debris gives kittens an escape route from predators, as well as cover from the elements. During the first few months of life, when kittens are left alone while the mother hunts, denning habitat must be available throughout the home range (Bailey 1974). The LCAS recommended two standards and two guidelines related to denning habitat. These are reflected in Alternative B as *Standards VEG S3 and VEG S4 and Guidelines VEG G2 and VEG G3*.

In Alternative B Standard VEG S3 defers vegetation management projects in places with the potential to develop into denning habitat if an LAU contains less than ten percent denning habitat. Standard VEG S4 limits salvage harvest in some situations. Guideline VEG G2 says when more denning habitat is desired to leave standing trees and coarse woody debris. Guideline VEG G3 says to locate denning habitat where there is a low probability of stand-replacing fire.

<u>Development of alternatives for the DEIS</u>

Some people said that den sites can be found in old regenerating forests and the agency should be allowed the flexibility to create denning habitat in regeneration units, especially since denning habitat should be located in or adjacent to forage. In Maine, 17 den sites were located in a variety of stand types, including 10-20 year old clearcuts adjacent to residual stands (FEIS, Vol. 1, Appendix P).

After reviewing the literature, we determined it was reasonable to have an alternative that allows for flexibility to mitigate or create denning habitat, especially when there is less than 10 percent denning habitat. Alternatives D and E modify Standard VEG S3 to say where there is less than 10 percent denning habitat either: 1) defer management, or 2) move towards 10 percent by leaving standing dead trees or piles of coarse woody debris. This combined the guidance in Alternative B, Guideline VEG G2 with the Standard VEG S3.

Some people said salvage harvest should not be singled out because it is not the only management action that removes denning habitat. Standard VEG S4 limits salvage harvest after a disturbance kills trees in areas five acres or smaller – if there is less than 10 percent denning habitat.

We evaluated whether other management actions, such as prescribed burning, chipping, piling and burning, etc. should be precluded. Salvage harvest is the primary management action that removes denning habitat because it removes dead and down timber; therefore we determined other actions did not need to be constrained. However, we determined that Standard VEG S4 should be a guideline in Alternatives D and E because it provides guidance on how to design projects. The guideline says when there is less than 10 percent denning habitat, then units should consider retaining small areas of dead trees. As noted in Alternatives D and E, Standard VEG S3, units can mitigate when there is less than 10 percent denning habitat. It is possible to create denning habitat or retain pockets, but units should be allowed to evaluate denning needs on a site specific basis.

The intent of Alternatives D and E, is where denning habitat is lacking, units should recognize it, retain large and small patches and/or mitigate, especially if it denning habitat can be created in or near new forage areas. In most areas denning habitat is likely not limiting because it is found in such a variety of stand conditions and ages.

Considerations for alternatives in the FEIS

In comments on the DEIS some people said there was no basis for retaining ten percent denning habitat – they wanted the standard dropped altogether. Others wanted more denning habitat required. Some people asked for an alternative to prohibit harvest in old growth or mature timber to protect denning habitat. Others said that all old growth should be protected by management direction because some administrative units do not meet old growth standards.

Some people said allowing salvage logging in disturbed areas smaller than five acres lacked a scientific basis and that all salvage harvest should be deferred. Most comments on the DEIS said that management direction for denning habitat should be in the form of standards.

In their comments on the DEIS FWS supported Standard VEG S3, including conditions 1 and 2 in Alternative E, but was concerned about changing Standard VEG S4 into Guideline VEG G7. FWS recommended development of a standard that: 1) maintains ten percent denning habitat within an individual LAU; 2) is randomly/evenly distributed across the LAU; and 3) ensures recruitment of future denning habitat.

Based on these comments, we reconsidered the management direction for denning habitat. We held discussions with the researchers, lynx biology team and FWS to further explore denning habitat – where it is found, how to measure it, and how to ensure plans provide the appropriate level of management direction.

Where denning habitat is found: Since 1989 researchers have discovered that lynx denning habitat is found in a variety of structural stages from young regenerating forests to old forests. The integral component of lynx den sites appears to be the amount of downed, woody debris, not the age of the forest stand (Mowat, et al. 2000). Research by Squires (pers. com. Oct. 30, 2006) has found that of 40 den sites in northwest Montana most were located under large logs, but "jack-strawed" small diameter wind thrown trees, root wads, slash piles, and rock piles were also used (FEIS, Vol. 1 p. 172-173). These structural components of lynx den sites can often be found in managed (logged) and unmanaged (e.g. insect damaged, wind-throw) stands.

How to measure denning habitat: Retaining ten percent denning habitat is based on maintaining lynx habitat over time (Brittel et al. 1989). Brittel recommended a balance of conditions – 30 percent forage, 30 percent unsuitable that would grow into forage, 30 percent travel, and ten percent denning.

We evaluated how to measure 10 percent denning based on where the habitat can be found. We evaluated using mature and over-mature forests as a first approximation of denning habitat. Generally mature and over-mature forests contain a component of dead and down trees which lynx use. If these two components were used then all units would show much more than ten percent denning habitat as all forests have at least twenty percent of their forest in mature stand structures (Project file/Analysis/Forests/FEIS/Data). In addition, these stand structures do not account for all the stand conditions where denning habitat can be found because denning habitat can be found in young forests with slash piles, lodgepole forests with insect and disease outbreaks, areas recently burned in wildfires, as well as variety of other forest conditions. Based on these discussions, we decided, with agreement from FWS, that using stand structures as a proxy would show an abundance of denning habitat; therefore the requirement to retain ten percent was found not to be a useful measure.

How to provide for denning habitat:

We considered restricting harvest in mature forests and old growth. The important component for all lynx den sites appears to be the amount of down woody debris present, not the age of the forest (Mowat et al. 2000, Appendix P). Old growth and mature forests can provide denning habitat, but based on review of research a variety of forest structures also provide denning habitat. We considered prohibiting timber harvest in old growth but dismissed this from detailed consideration because denning habitat is found in a variety of forest structures (FEIS, Vol. 1 p. 81).

We considered restricting salvage harvest. Standard VEG S4 in Alternatives B and C limits salvage harvest after a disturbance kills trees in areas five acres or smaller – if there is less than 10 percent denning habitat. The standard was changed to a guideline in Alternatives D and F. The guideline says that when there is less than 10 percent denning habitat, then units should consider retaining small areas of dead trees.

Salvage harvest can remove denning habitat. However, den sites are found in areas with large logs, "jack-strawed" small diameter wind thrown trees, root wads, slash piles, and rock piles. These areas need not be extensive – they are generally small areas that provide sufficient cover for lynx den sites.

We reevaluated whether or not denning habitat is a limiting factor for lynx. Based on discussions with research, we reaffirmed that denning habitat is found in a variety of forest conditions, they are found in small pockets scattered across an area and are generally found across the landscape, and lynx denning sites are not believed to be a limiting factor (J. Squires, pers. com. Oct. 30, 2006). In addition, management actions can create denning habitat by strategically leaving piles of woody debris, or leaving residual trees where denning habitat is lacking.

Therefore, we determined that restricting salvage harvest was not necessary, but that projects should consider the abundance and distribution of denning habitat in their project design and leave den site components (piles of down wood, or standing dead trees) where it is lacking.

We considered management direction in the form of standards vs. guidelines. We determined management direction for denning habitat should be incorporated into one set of management direction. Incorporating all the direction into one standard or guideline reduces the potential for conflicts between directions, focusing on the important components of denning habitat.

We determined a guideline would be best suited for this management direction because denning habitat can be found in a variety of forest structures and in small areas, is not a limiting factor for lynx, and the management direction would provide design features for projects. Therefore we developed Guideline VEG G11 in the selected alternative. The guidance is to: 1) have denning habitat distributed across an LAU (in the form of pockets of large woody debris, either down logs or root wads, or large piles of jack-strawed trees); and 2) if denning habitat is lacking, projects should be designed to retain coarse woody debris – by leaving piles or retaining residual trees that can become denning habitat later.

Objectives VEG O1, VEG O2, VEG O3, and VEG O4 and Standards VEG S1, VEG S2, and VEG S6 also indirectly promote the development and retention of the structure needed for denning habitat through vegetation management that promotes a mosaic of forest conditions across the landscape (USDI FWS 2007). Based on the above, FWS determined that projects were unlikely to reduce denning structure to levels that result in adverse effects to lynx (USDI FWS 2007).

In addition, the Lynx Biology Team (the team responsible for the LCAS) is in the process of updating the LCAS denning habitat recommendations based on this new information about where denning habitat is found and its distribution.

Consideration of fuel treatment projects

Most lynx habitat consists of high-elevation spruce/fir and lodgepole pine forests, but some lynx habitat may be found in mixed conifer forests. Generally, forests in lynx habitat are close to historic conditions, meaning the long fire return interval has not been affected to any large degree by more recent fire suppression as is the case in dryer forests with short fire return intervals. However, some stand conditions are conducive to extreme fire behavior because of insect and disease mortality or the amount of tree limbs that provide ladder fuels. Fuel treatments designed to reduce ladder fuels and/or reduce the potential size (Finney 2001) and severity of wildland fires may be proposed in lynx habitat.

After the 2000 wildfire season, which burned a substantial amount of acreage, the Forest Service began to set goals for wildfire management. Several documents serve to provide a national prioritization system for the selection of hazardous fuel treatments on Federal lands with close coordination among the Federal, State, and other agencies, as well as Tribes and communities. The criteria for prioritizing lands for hazardous fuels treatment generally correspond to: (1) closest proximity to communities at risk in the WUI; (2) strategic areas outside the WUI that prevent wildland fire spread into communities or critical infrastructure; (3) areas outside of WUI that are in Condition Classes 2 or 3; and (4) other considerations (FEIS, Vol. 1 p. 215).

The LCAS did not specifically address fuel treatments. During scoping we identified wildland fire risk as an issue, issue # 2 (FEIS, Vol. 1 p. 21-22). We developed a range of alternatives to address this issue.

In Alternative A, there would be no change in existing plan direction on the treatment of fuels.

Alternative B would allow fuel treatments to go forward if they:

- Meet the 10 percent denning standard (Standard VEG S3 and S4)
- Meet 30 percent unsuitable habitat standard (Standard VEG S1) or 15 percent unsuitable habitat created by timber harvest standard (Standard VEG S2)
- Use methods other than precommercial thinning in winter snowshoe hare habitat (Standards VEG S5 and VEG S6)

Alternatives C and D would not allow any type of fuel reduction project that reduced winter snowshoe hare habitat – except within 200 feet of structures.

Alternative E, the DEIS preferred alternative would not apply the vegetation standards (Standards VEG S1, S3, and S5) to fuel treatments developed in a collaborative manner, as described in the *10-Year Comprehensive Strategy Implementation Plan* (USDA FS 2001). This exception was used because a multi-party Memorandum of Understanding was signed in 2003 by the FS, BLM, and FWS (USDA FS et al. 2003) concerning fuel treatments and collaboration.

Many comments were received on the DEIS regarding fuel treatments. Some people suggested there be no exemptions for fuel treatments. Several groups suggested that only fuel treatments within 500 yards of human residences and other structures be allowed because these areas are generally not appropriate to restore lynx anyway. Others felt the exemptions should only apply to the WUI and that the agencies should define the WUI. Others liked the exemptions as they were written in Alternative E.

FWS cautioned against exempting a broad range and unknown number of actions from plan direction. They felt, as currently worded in Alternative E, the exemption was sufficiently vague that it did not allow an adequate analysis of potential effects upon lynx or lynx habitat and it could result in extensive adverse effects to lynx.

FWS suggested Standard VEG S5 be modified to restrict precommercial thinning to within one mile of structures. They did not believe any exemptions were needed for Standards VEG S1 or S2 since so very few LAUs were near the thresholds identified in these standards. They felt very few proposals would be constrained by the standards. They also questioned why Condition Class 1 forests were not specifically excluded from the exemptions. Condition Class 1 forests include areas where fires have burned as often as they did historically; the risk of loosing key ecosystem components is low; and vegetation composition and structure is intact and functioning. The FWS went on to say they recommended that processes, actions, or types that would be exempt be clearly identified.

We reviewed and discussed the comments with FWS and decided to modify the fuel treatment exemption for the selected alternative. We thoroughly discussed the issue of how to allow for fuel treatments to reduce the hazard to communities – while providing for the conservation and recovery of lynx (Project File/Alternatives/FEIS alternatives).

Based on our discussions we decided none of the vegetation standards will apply to fuel treatment projects within the WUI as defined by the Healthy Forests Restoration Act (HFRA), within a certain limit. We constrained the number of acres that do not meet the standards to 6 percent of lynx habitat within a National Forest, and we added the FWS term and condition that fuel treatment projects can cause no more than 3 adjacent LAUs to not meet standard VEG S1.

In addition we added Guideline VEG G10 which says fuel treatment projects within the WUI 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 WUI 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 WUI.

The following describes some of the considerations in the development of this direction.

Application to Standards VEG S1 and S2: Under Standards VEG S1 and S2 it is likely very few projects would exceed the 30 percent and 15 percent criteria because many fuel treatment projects are not regeneration harvest. If regeneration harvest is applied it is likely to be done to create a fuel break adjacent to communities or to break up the continuity of fuels (Finney 2001). Since part of our direction under the Healthy Forests Initiative is to look for ways to expedite fuel reduction projects we determined that we did not want to have to amend forest plans for the few cases where not meeting the standards may be necessary.

Application to Condition Class 1: Many forests in lynx habitat are in Condition Class 1, meaning these forests have not missed a fire cycle because large, stand-replacing fire only occurs every 100 to 200 years. However, some of these Condition Class 1 forests can still be a threat to communities. An example is lodgepole pine forests which are at the age of being susceptible to mountain pine beetle outbreaks. Regenerating lodgepole pine, adjacent to a community, may be needed to reduce the severity and size of a wildland fire. Fire is a natural process in these ecosystems; but there is a need to balance the natural process with the risk of fire destroying homes; therefore we did not limit the standard to particular condition classes.

What locations should be exempted: We evaluated various options regarding where the standards should be applied and we used a variety of criteria to evaluate which option to carry forward for detailed consideration. The criteria included: 1) is there a defined area; 2) can effects be meaningfully evaluated; 3) would it provide for community protection; and 4) does it meet the purpose and need. (For further detail see FEIS, Vol. 1 pp. 85-86 which summarizes the options and considerations and the Project File/Alternatives/FEIS Alternatives/documents July 29, 2004 through February 24, 2005).

Based on comments, national direction regarding fuel treatments, and the effects on lynx, we decided exempting fuel treatment projects within the WUI, within limits would be a reasonable balance. We decided to use the definition established by Congress in the HFRA as it established a national procedure for determining the extent of the WUI (USDI, USDA FS 2006).

What limit(s) should be applied: We elected to put a limit on the amount of fuel treatment projects that could exceed the vegetation standards, since WUI has not been mapped on all units. We evaluated the WUI based on a mile of where people live (FEIS, Vol. 1 p. 217). A one mile buffer from communities was used because HFRA describes WUI as ½ mile or 1 ½ miles depending on certain features. One mile splits this difference and is easy to approximate. Based on this analysis, we found that about 6 percent of lynx habitat is within 1 mile of communities; therefore we limited the amount of acres that can exceed the standards to 6 percent of each National Forest.

In addition, FWS identified two terms and conditions (TC) to minimize impacts of incidental take of lynx due to fuel treatment projects. TC 1 (6 percent limit) was already incorporated as described above; TC 2 says fuel treatment projects shall not result in

more than three adjacent LAUs exceeding the standard. This TC has been incorporated into the management direction – see Attachment 1.

Summary: Exempting fuel treatment projects within the WUI provided a defined area, as requested by FWS; we could evaluate the effects (FEIS, Vol. 1 Lynx section); it provides for community protection by reducing delay; and meets the purpose and need by constraining the area where adverse effects could occur. In addition we compiled information from each forest's 5 year fuel treatment program to evaluate effects – FEIS, Vol. 1, Lynx section and Appendix M, and USDI FWS 2007. This information was not available for the DEIS. We found that although we would limit adverse effects to 6 percent of lynx habitat, it is more likely only 1.4 percent or less of lynx habitat would have adverse effects. This is because the fuel treatment program of work within the WUI only amounts to 1.4 percent of lynx habitat and many projects can be designed to meet the vegetation standards. Regardless, the vegetation standards would apply to fuel treatments on 94 percent of lynx habitat.

In addition, by addressing the exemption and putting a limit on where adverse effects could occur this allowed us to take a cumulative look at the effects planning area wide vs. amending standards project-by-project.

FWS findings related to the vegetation management direction

The vegetation management direction set forth in the selected alternative conserves the most important components of lynx habitat: a mosaic of early, mature, and late successional staged forests, with high levels of horizontal cover and structure. These components ensure the habitat maintains its inherent capability to support both snowshoe hare prey base and adequate lynx foraging habitat (and denning habitat) during all seasons. These standards are required for all vegetation management actions on at least 93.5 percent of lynx habitat in the planning area. Areas within the WUIs (totaling six percent of lynx habitat) are exempt from these standards; however VEG G10 would apply and at least requires some consideration of the standards in designing fuel reduction treatments. Precommercial thinning, allowed under the exceptions, may affect an additional 0.5 percent of lynx habitat. Where these standards are applied to vegetation management projects, we anticipate few, if any, would have adverse effects on lynx. Collectively, application of these standards for vegetation management is expected to avoid adverse effects on lynx and promote the survival and recovery of lynx populations (USDI FWS 2007).

Management direction related to grazing

Livestock grazing may reduce or eliminate foraging habitat in areas that grow quaking aspen and willow in riparian areas (LCAS). These localized changes in habitat may affect individual lynx; however, no information indicates that grazing poses a threat to overall lynx populations (FEIS, Vol. 1, Appendix P, p. 40083). Appropriate grazing management can rejuvenate and increase forage and browse in key habitats such as riparian areas. Grazing was not mentioned in the original listing decision as a threat to

lynx, nor is it discussed in *the Ecology and Conservation of Lynx in the United States* (Ruggiero et al. 2000). In addition, FWS noted that they have found no research that provides evidence of lynx being adversely affected by grazing within the planning area or elsewhere, or of lynx movements within home ranges being impeded by grazing practices (USDI FWS 2007).

The LCAS recommended four standards for grazing management. These are reflected in Alternative B. *Standards GRAZ S1, GRAZ S2, GRAZ S3, and GRAZ S4* provide management direction for grazing in fire and harvest created openings, aspen stands, riparian areas and willow carrs, and shrub-steppe habitat. Alternatives C and D retain the management direction as standards. Alternative E changes the management direction to Guidelines GRAZ G1, GRAZ G2, GRAZ G3, and GRAZ G4 because neither the Remand Notice nor the *Ecology of Conservation of Lynx in the United States* recognized grazing as a threat to lynx.

Many people commented on Alternative E, the preferred alternative in the DEIS, and said the guidelines should be standards in the final alternative. Others said grazing should not be allowed at all, while two said the grazing guidelines should be retained. The FWS did not comment on the level of grazing management direction in Alternative E. We considered these comments in the FEIS Vol. 1 pp. 86-87, as well as Vol. 2, 75-76.

We decided the management direction for grazing in the selected alternative should be in form of guidelines, Guidelines GRAZ G1 through GRAZ G4 because there is no evidence grazing adversely affects lynx. These guidelines provide project design criteria for managing grazing in fire and harvest created openings, aspen, willow, riparian areas, and shrub-steppe habitats. The guidelines are designed to minimize potential adverse effects and improve habitat conditions. FWS found that with the application of these measures in most cases, there would be no effects or discountable effects to lynx (USDI FWS 2007). In addition, the Lynx Biology Team is in the process of updating the LCAS grazing recommendations.

Management direction related to human uses

Over-the-snow winter recreation

Lynx have very large feet in relation to their body mass, providing them a competitive advantage over other carnivores in deep snow. Various reports and observations have documented coyotes using high elevation, deep snow areas (Buskirk et al. 2000). Coyotes use open areas because the snow is more compacted there, according to research conducted in central Alberta (Todd et al. 1981). In another study in Alberta, coyotes selected hard or shallow snow more often than lynx did (Murray et al. 1994).

The LCAS recommended two objectives and two standards relating to winter dispersed recreation. These are reflected in Alternative B, *Objectives HU O1 and HU O3, and Standards HU S1 and HU S3*. In Alternative B, Standard HU S1 would maintain the existing level of groomed and designated routes. All action alternatives contain

Objectives HU O1 and HU O3 that discourage expanding snow-compacting human activities. Alternatives B, C, and D contain Standard HU S1 that would allow existing over-the-snow areas to continue but not expand into new, un-compacted areas. Alternative E, the DEIS preferred alternative, contains Guideline HU G11 that discourages the expansion of designated over-the-snow routes and play areas into uncompacted areas. All alternatives would allow existing special use permits and agreements to continue.

In comments on the DEIS some people asked that no dispersed over-the-snow use be allowed off groomed or designated trails and areas, saying the no net increase in groomed or designated routes did not go far enough. Others said the management direction should be in the form of a standard, not a guideline.

Some people said standards related to over-the-snow use should be removed. They said there is no evidence to show that coyotes and other predators use packed snow trails to compete with lynx for prey, and the amount of compaction created by snowmobiles is insignificant compared to the compaction created naturally by the weather. They were particularly concerned that if such language was introduced into plans, it could be difficult to change, incrementally restricting the places where snowmobiling is allowed. Others wanted an allowance made to increase use. These comments were considered for management direction – see FEIS Vol. 1 pp. 90-93.

In their comments on the DEIS the FWS agreed it is prudent to maintain the status quo and restrict expansion of over-the-snow routes until more information is available because of the possibility that, over time, unregulated expansion could impair further conservation efforts. They also said current, ongoing research in Montana may shed some information on the effects of snow compaction on lynx. They suggested careful consideration of the most recent information and the reality of possible impairment of options for the future. They suggested considering language that could provide more guidance on conditions where the expansion of over-the-snow routes would be warranted and acceptable.

We reviewed the results of research conducted since the DEIS was released. In northwestern Montana (within the northern lynx core area) Kolbe et al. (in press) concluded there was "little evidence that compacted snowmobile trails increased exploitation competition between coyotes and lynx during winter on our study area." Kolbe et al. (in press) suggested that compacted snow routes did not appear to enhance coyotes' access to lynx and hare habitat, and so would not significantly affect competition for snowshoe hare. They found that coyotes used compacted snow routes for less than 8 percent of travel, suggesting normal winter snow conditions allowed access by coyotes, regardless of the presence or absence of compacted snow routes. Kolbe was able to directly measure relationships between coyotes, compacted snow routes and snowshoe hare in an area that also supports a lynx population (USDI FWS 2007). In this study coyotes primarily scavenged ungulate carrion that were readily

available while snowshoe hare kills comprised only three percent of coyote feeding sites (Kolbe et al. in press).

In the Uinta Mountains of northeastern Utah and three comparative study areas (Bear River range in Utah and Idaho, Targhee NF in Idaho, Bighorn NF in Wyoming) Bunnell (2006) found that the presence of snowmobile trails was a highly significant predictor of coyote activity in deep snow areas.

From track surveys it was determined the vast majority of coyotes (90 percent) stayed within 350 meters of a compacted trail and snow depth and prey density estimates (snowshoe hares and red squirrels) were the most significant variable in determining whether a coyote returned to a snowmobile trail (Bunnell 2006). Of the four study areas recent lynx presence has only been documented on the Targhee NF. Bunnell indicated that "circumstantial evidence" suggested the existence of competition.

To date, research has confirmed lynx and coyote populations coexist, despite dietary overlap and competition for snowshoe hare, the primary prey of lynx, and alternate prey species. In some regions and studies, coyotes were found to use supportive snow conditions more than expected, but none confirm a resulting adverse impact on lynx populations in the area. The best scientific information (Kolbe's study) is from an occupied core area within our planning area. Radio-collared lynx and coyotes were monitored in this study, unlike the Bunnell study. This area is occupied by both lynx and coyotes and the study concludes coyotes did not require compacted snow routes to access winter snowshoe hare habitat.

Based on this information, we reevaluated management direction related to over-the-snow activities. An alternative to prohibit all snow-compacting activities or to limit dispersed use was evaluated, but not considered in detail because current research indicates this level of management direction is unwarranted (USDI FWS 2000a; FEIS, Vol. 1, Appendices O and P).

An alternative to drop all direction limiting snow compaction was not developed in detail because there is evidence competing predators use packed trails, suggesting a potential effect on individual lynx. We decided it was prudent to maintain the status quo and not let over-the-snow routes expand. However, we also decided it was reasonable to retain the direction as a guideline in the selected alternative which can be used in project design. The intent is to follow the management direction in guidelines. However, there may be some cases where expansion of over-the-snow routes would be warranted and acceptable, or where research indicates there would be no harm to lynx. Guidelines are better suited to adaptive management.

There is also no basis to establish any particular threshold of allowable increases. However, the selected alternative allows expanding winter recreation in some places where heavy public use existed in 1998, 1999, or 2000 – see Guideline HU G11.

The FWS concluded the Objectives HU O1 and O3, and Guideline HU G11 would be sufficient to maintain habitat effectiveness for lynx by limiting the expansion of

compacted snow routes and this conclusion would be tested through monitoring required in this decision. The best information available has not indicated compacted snow routes increase competition from other species to levels that adversely affect lynx populations, and under the selected alternative the amount of areas affected by snow compacted routes would not substantially increase (USDI FWS 2007).

Developed recreation

The LCAS identified risk factors associated with ski areas, including *short-term effects* on denning, foraging, and diurnal security habitat and *long-term effects* on movement within and between home ranges (LCAS, p. 2-10). Ski areas may eliminate habitat and pose a threat to movements; but most were constructed before lynx became a conservation issue (Hickenbottom et al. 1999, p. 70). Mitigation measures can be developed at the project level to lessen the effects of existing developments.

The LCAS recommended various objectives, standards, and guidelines in relation to developed recreation, specifically ski areas. These are reflected Alternative B*, Objectives ALL O1, HU O2, HU O3, and HU O4; Standards ALL S1 and HU S2; and Guidelines HU G1, HU G2, HU G3, and HU G10.* Objectives and standards *(LINK O1 and LINK S1)* regarding habitat connectivity also address concerns about developed recreation. These objectives, standards, and guidelines provide management direction about ski area development, expansion, and operations to provide for lynx movement, security, and habitat needs.

The alternatives retain similar management direction as Alternative B, except Alternatives C, D, and E changed Standard HU S2 to Guideline HU G10. Standard HU S2 requires diurnal habitat to be maintained, if needed. There is no evidence that diurnal security habitat is required by, or where it occurs on ski areas is used by lynx (USDI FWS 2007). Since the need to provide diurnal habitat is questionable, we determined it was better suited as a guideline.

In commenting on the DEIS some people said ski areas should be removed or at least prevented from expanding. Others recommended the final preferred alternative retain Standard HU S2. There are 24 existing down hill and cross country ski areas in occupied habitat in the planning area, which affect about 17,500 acres out of the 12.5 million acres of occupied habitat. Eight down hill ski areas are planned for expansion. One new ski area is proposed. Most of the ski areas are located on individual mountain ranges, not several together as in other areas in the west (FEIS, Vol. 1 p. 285). There is no indication these ski areas affect lynx travel because these ski areas are spread across the planning area. There is no information that indicates removal of ski areas is warranted, nor is limiting their expansion, as long as lynx needs are considered. The selected alternative includes standards to provide for lynx habitat connectivity, and includes guidelines to be use in the development of ski area expansion. Many adverse effects of developed recreation will be minimized under the selected alternative (USDI FWS 2007).

Minerals and energy

The LCAS said the main risk factors associated with minerals and energy development is related to the potential for plowed roads to provide access for lynx competitors.

These recommendations are reflected in Alternative B, *Objectives ALL O1, HU O1, and HU O5, Standards ALL S1 and HU S3, and Guidelines HU G4, and HU G5* which provide management direction for mineral and energy development. All except standard HU S3 remain essentially the same in all alternatives. Standard HU S3 says to keep mineral and energy development to designated routes. This standard was changed to Guideline HU G12 in Alternative E and in the selected alternative to be consistent with the application of management direction regarding over-the-snow routes discussed above.

In commenting on the DEIS some people said lease stipulations identifying constraints on developing oil and gas, coal, or geothermal resources should be one of the decisions made as a part of the management direction. This comment is addressed in the FEIS, Vol. 1 p. 94-95. FWS did not comment on the management direction related to minerals and energy development.

Forest roads

Lynx are known to have been killed by vehicle-collisions in Colorado (reintroduced population; paved, high-speed highways), in Minnesota (paved, high-speed highways) and in Maine (high-speed, relatively straight gravel roads on flatter terrain). The best information suggests that the types of roads managed by the Forest Service do not adversely affect lynx (USDI FWS 2007). Lynx mortality from vehicle strikes are unlikely, and to date none have been documented on National Forest System lands within the planning area, given the relatively slow speeds at which vehicles travel on these roads (due to topography and road conditions) and generally low traffic volumes.

Roads may reduce lynx habitat by removing forest cover. Along less-traveled roads where the vegetation provides good hare habitat, sometimes lynx use the roadbeds for travel and foraging (Koehler and Brittell 1990; LCAS, p. 2-12). A recent analysis on the Okanogan NF in Washington showed lynx neither preferred nor avoided forest roads, and the existing road density does not appear to affect lynx habitat selection (McKelvey et al. 2000; USDI FWS 2000a, p. 39).

Although many species of wildlife are disturbed when forest roads are used (Ruediger 1996), preliminary information suggests lynx do not avoid roads (Ruggiero et al. 2000) except at high traffic volumes (Apps 2000). In denning habitat, when roads are used during summer, lynx may be affected if they move their kittens to avoid the disturbance (Ruggiero et al. 2000; LCAS, p. 2-12).

The LCAS recommended several guidelines to address potential impacts of forest roads, including upgrading, cutting and brushing, and public use. These guidelines generally discourage improving access for people or reduce the likelihood people would see lynx near roads. These guidelines are reflected in Alternative B, *Guidelines*

HU G6, HU G7, HU G8, and HU G9. All the alternatives, including the selected alternative retain these guidelines.

In commenting on the DEIS some people said more restrictions on roads were needed to conserve lynx. They wanted new road construction halted, road densities identified and existing roads closed or eliminated, or they wanted the roads guidelines turned into standards. Other people said there should be no road-related standards or guidelines, saying no evidence exists that roads harm lynx. Some people said Guideline HU G9 should be deleted because there are no compelling reasons to close roads. The FEIS, Vol. 1, pp. 95 to 96 describes how these were considered in the development of the management direction. FWS had no comments related to these guidelines.

Based on our review we found no information indicating road building should be banned or that further restrictions were needed. The guidelines adequately address the known risks associated with roads. We determined guidelines were the appropriate level of management direction because guidelines provide information and guidance for project design and decision-making. Some guidance on how to design projects is warranted because roads may affect individual lynx.

Management direction related to linkage areas

Highways and connectivity

Highways impact lynx by fragmenting habitat and impeding movement. As traffic lanes, volumes, speeds, and rights-of-way increase, the effects on lynx are increased. As human demographics change, highways tend to increase in size and traffic density.

The LCAS recommended one objective, two standards, and a guideline directly or indirectly related to highways and connectivity. These are reflected in Alternative B, *Objective ALL O1*, *Standards ALL S1* and *LINK S1,* and *Guideline ALL G1*. Objective ALL O1 and Standard ALL S1 are intended to maintain connectivity. Standard LINK S1 is intended to provide a process for identifying wildlife crossings across highways.

Alternatives C, D, E and the selected alternative have the same objective and standards.

In comments on the DEIS some people said more should be done than just identifying highway crossings. FWS did not comment on management direction related to highways.

The LCAS recommended project standards for highways. It says to "Identify, map and prioritize site-specific locations, using topographic and vegetation features, to determine where highway crossings are needed to reduce highway impacts on lynx and other wildlife". Alternatives B, C, D, E and the selected alternative include Standard LINK S1 which reflects the intent of the LCAS recommendations. In addition, Guideline ALL G1 says "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."

As noted in Chapter 3, Transportation Section, portions of three highways are likely to be reconstructed in linkage areas in the next ten years. State agencies in Wyoming, Idaho, and Montana are incorporating wildlife crossings into their highway design packages (Wyoming Department of Transportation, 2005; Idaho Transportation Department 2004; Montana DOT, FHWA, Confederated Kootenai and Salish Tribes 2006). Therefore no further management direction regarding wildlife crossings in the form of standards was found to be warranted.

Other considerations in linkage areas

Coordination among different land management agencies is important to the recovery of lynx because lynx have large home ranges and may move long distances. The LCAS recommended guidance for working with landowners to pursue solutions to reduce potential adverse effects. This recommendation is reflected in Alternative B, *Objective LINK O1*. This objective is the same among all alternatives, including the selected alternative.

In addition, it is important to mention the Forest Service is a lead member in the interagency Lynx Steering Committee and the Lynx Biology Team (FEIS, Vol. 1 Chapter 4), and played a key coordination role for the Lynx Science Team. These efforts facilitate relationships with other Federal and non-Federal landowners, including the States and provide a source for non-Federal land management guidance, through products such as the LCAS and Forest Plans. The Steering Committee would also provide a forum to build and sustain cooperative efforts with Canada to maintain lynx connectivity across the international border, if and when the need arises (USDI FWS 2007). The Forest Service also led the interagency effort to identify linkage areas.

Use of standards and guidelines

The selected alternative incorporates standards for those risk factors found to threaten lynx populations. Standards are management requirements used to meet desired conditions. Standards were used in those situations where we wanted to provide sideboards for project activities. Guidelines were used for those risk factors that may have possible adverse affects on individual lynx. Guidelines are management actions normally taken to meet objectives. They provide design criteria to meet lynx objectives. We expect guidelines to be followed in most cases, however based on site-specific conditions there may be reason not to follow a guideline.

FWS found guidelines would be implemented in most cases and adverse effects would not always occur where guidelines are not implemented. Effects would be based on site-specific conditions, with compliance with Section 7 consultation for each project. The FWS does not expect adverse effects as a result of changes of LCAS standards to guidelines to reach levels that impact lynx populations. Changes from standards to guidelines occurred when the best available information indicated the action was not likely to adversely affect lynx, or not likely to adversely affect lynx in most cases (i.e. where no conclusive or reliable information supported the standard in the LCAS).

Application of the standards, and for the most part guidelines, in core and occupied secondary areas substantively reduce the potential for adverse effects on lynx over the existing plans (USDI FWS 2007).

In addition, we will monitor the application of guidelines to see if our assumption they are normally applied is correct. Annually we will review the monitoring results to determine if further consideration is warranted.

Where to apply the decision

The selected alternative is incorporated into all forest plans in the planning area (FEIS, Vol. 1, Table 1-1 p. 5 and Figure 1-1). However, the management direction only applies to occupied lynx habitat. Those National Forests (the Beaverhead-Deerlodge, Bitterroot, Nez Perce in Region 1; the Bighorn in Region 2; and the Ashley, and Salmon-Challis in Region 4), or isolated portions of National Forests (the Custer, Gallatin, Helena and Lewis and Clark in Region 1), that presently are unoccupied by Canada lynx should consider the management direction that is now incorporated into their Forest Plans when developing projects, but are not required to follow the management direction until such time as they are occupied by Canada lynx.

According to the Conservation Agreement (USDA FS, USDI FWS 2006a), an area is considered occupied when: (1) there are at least 2 verified lynx observations or records since 1999 on the national forest, unless they are verified to be transient individuals; or (2) there is evidence of reproduction on the national forest.

This direction is in keeping with the current Conservation Agreement which only applies to projects and activities in occupied habitat. The FWS species lists on those forests and portions of forests that are unoccupied do not show lynx as a species for consideration. However, as noted in the Biological Opinion, the FWS said, and we agree that lynx detection is needed to assess whether further management direction is warranted (USDI FWS 2007). Therefore, we agree to work with the FWS to develop and complete an acceptable protocol to survey currently unoccupied lynx habitat in secondary areas as described in the Biological Opinion, Term and Condition #4.

Incorporation of terms and conditions

On March 16, the FWS issued its Biological Opinion on the Northern Rockies Lynx Management Direction (USDI FWS 2007). In the opinion the FWS concluded that the management direction would overall be beneficial, but that some adverse effects to lynx would still be anticipated. It determined the management direction would not jeopardize the continued existence of lynx. The opinion also provides an incidental take statement which specifies the impact of any incidental taking of lynx. It also provides reasonable and prudent measures that are necessary to minimize the impacts of the take and sets forth terms and conditions which must be complied with in order to implement the reasonable and prudent measures.

The opinion identified three reasonable and prudent measures (RPM) with four associated terms and conditions (TC). We incorporated TC 1 through 3 into the management direction. The TCs are shown in italics in Attachment 1. TC #4 is agreed to as described below.

RPM #1: Minimize harm from fuels management by ensuring the acres impacted are not concentrated in a geographic area or several adjacent LAUs

Ensure fuels management projects conducted under the exemptions from Standards VEG S1, S2, S5 and S6 in occupied habitat:

TC 1. do not occur in greater than 6 percent of lynx habitat on any forest; and

TC 2. do not result in more than 3 adjacent LAUs not meeting the VEG S1 standard.

TC 1 was already part of the management direction. TC 2 has been added to Standard VEG S1.

RPM #2: Minimize harm from precommercial thinning and vegetation management by ensuring that LAUs either retain sufficient foraging habitat, or do not substantially reduce foraging habitat.

TC 3. In occupied habitat, precommercial thinning and vegetation management projects allowed per the exceptions listed under VEG S5 and S6, shall not occur in any LAU exceeding VEG S1, except for projection of structures. This requirement has been added to Standards VEG S5 and VEG S6.

RPM #3: On those Forests with currently unoccupied lynx habitat, lynx detection is needed to assess whether further management direction is warranted, including application of the management direction.

TC 4. Within 18 months of the date of the Biological Opinion, the Forest Service shall work with the Service to develop and complete an acceptable protocol to survey currently unoccupied lynx habitat in secondary areas. We agree to work with the FWS to develop and complete the protocol in unoccupied secondary areas.

The FWS also identified several monitoring and reporting requirements related to the above terms and conditions. We have incorporated these elements in the selected alternative – see Attachment 1, page 9.

Consideration of conservation recommendations

The FWS also identified three conservation recommendations which are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop information.

Recommendation 1. The FS should ensure to the extent possible, that unoccupied habitat continues to facilitate and allow dispersal of lynx into the future. Therefore the

FWS recommends the management direction regarding linkage areas and connectivity by applied in the unoccupied areas (ALL O1, ALL S1, ALL G1; LINK O1, LINK S1 and LINK G1). The Forest Service already considers and applies this management direction in our current program of work; therefore we have decided to not apply the direction in unoccupied areas until such time the areas are occupied.

Habitat connectivity is considered in the design of permanent developments and vegetation management. Few, if any, vegetation projects affect habitat connectivity. Most, if not all units, have some level of riparian area protection requirements in their existing plans. This direction facilitates movement of lynx through riparian areas.

The greatest risk to impeding connectivity is in relation to roads and highways. The Forest Service already works with the State and Federal Highway agencies and is part of the steering team that produced the document *Eco-logical: An Ecosystem Approach to Developing Infrastructure Projects* (USDOT, 2006), FEIS Transportation Section. Also noted in this section is the highway work planned and projected in all lynx habitat and how the states have incorporated wildlife crossings into the design of those future projects. The FEIS p. 198 evaluated the effects of not applying the management direction to unoccupied areas and discloses that there would be minimal effects, especially to linkage areas because similar management direction or the intent of the direction already exists.

Recommendation 2. The Forest Service should coordinate with the Service to develop, within 18 months a method to monitor the amount and condition of lynx habitat in unoccupied secondary habitat. The Forest Service agrees to this recommendation.

Recommendation 3. The Forest Service should continue to be a leader in lynx conservation and understanding. The Forest Service agrees to this recommendation.

Canada Lynx Recovery Outline

On September 12, 2005 the FWS issued a Recovery Outline for Canada lynx (USDI FWS 2005). The outline is to serve as an interim strategy to guide and encourage recovery efforts until a recovery plan is completed. In the Recovery Outline, FWS categorized lynx habitat as: 1) core areas; 2) secondary areas; and 3) peripheral areas. The areas with the strongest long-term evidence of the persistence of lynx populations within the contiguous United States are defined as "**core areas**." As we discuss below and illustrated on the enclosed map (Figure 1-1), we have two core areas in the analysis area. Core areas have both persistent verified records of lynx occurrence over time and recent evidence of reproduction. According to FWS, focusing lynx conservation efforts on these core areas will ensure the continued persistence of lynx in the contiguous United States by addressing fundamental principles of conservation biology (USDI FWS 2007). The Recovery Outline says "Recovery of lynx will be achieved when conditions have been attained that will allow lynx populations to persist long-term within each of the identified core areas." (USDI FWS 2005).

At this time, the role of areas outside of these core areas in sustaining lynx populations is unclear. The fluctuating nature of lynx population dynamics and the ability of lynx to disperse long distances have resulted in many individual occurrence records outside of core areas, without accompanying evidence of historic or current presence of lynx populations. Areas classified as "**secondary areas**" are those with historical records of lynx presence with no record of reproduction; or areas with historical records and no recent surveys that document the presence of lynx and/or reproduction. We have one area of secondary habitat in the analysis area (Figure 1-1). Much of the secondary habitat is unoccupied. FWS hypothesizes that secondary areas may contribute to lynx persistence by providing habitat to support lynx during dispersal movements or other periods, allowing animals to then return to "core areas."

In "**peripheral areas**" the majority of historical lynx records are sporadic and generally corresponds to periods following cyclic lynx population highs in Canada. There is no evidence of long-term presence or reproduction that might indicate colonization or sustained use of these areas by lynx. However, some of these peripheral areas may provide habitat enabling the successful dispersal of lynx between populations or subpopulations. We have four areas of peripheral habitat in the analysis area (Figure 1-1). At this time, FWS does not have enough information to clearly define the relative importance of secondary or peripheral areas to the persistence of lynx in the contiguous United States (USDI FWS 2005, USDI FWS 2007).

In the Recovery Outline, FWS presented four preliminary recovery objectives. Below, we summarize FWS findings (USDI FWS 2007) of how the selected alternative meets the recovery objectives.

Preliminary recovery objective 1: *Retain adequate habitat of sufficient quality to support the long-term persistence of lynx populations within each of the identified core areas.*

FWS concludes the selected alternative fulfills this objective and adequately manages the two core areas within the planning area to support lynx recovery. The selected alternative supports the long-term persistence of lynx populations within the Northwestern Montana/Northeastern Idaho and Greater Yellowstone core areas, which constitutes one third of the core areas nationwide (USDI FWS 2007).

Preliminary recovery objective 2: *Ensure that sufficient habitat is available to accommodate the long-term persistence of immigration and emigration between each core area and adjacent populations in Canada or secondary areas in the United States.*

FWS concludes the selected alternative contributes to this recovery objective in part.

Lynx have the ability to move great distances, through varied terrain and habitat. Dispersing lynx use a variety of habitats and prey resources compared to lynx attempting to establish a home range and territory (USDI FWS 2007).

Connectivity between the United States and Canada appears intact thus far, as the Northwestern Montana/Northeastern Idaho core area is directly adjacent to Canada

and includes Glacier Park along its northeastern edge. The selected alternative provides and conserves core area lynx habitat directly adjacent to and contiguous with lynx habitat in Canada. Such habitat should accommodate both immigration of lynx from Canada and emigration from core areas to secondary areas or Canada.

The selected alternative applies to all core areas and occupied secondary areas. The direction includes objectives, standards, and guidelines to actively maintain or restore lynx habitat connectivity in and between linkage areas and LAUs (lynx home ranges). Because these measures apply in both core and occupied secondary areas, the selected alternative clearly meets the recovery objective of accommodated long-term connectivity across these broad areas.

The selected alternative is less clear in its effects in unoccupied secondary areas between the Northwestern Montana/Northeastern Idaho and Greater Yellowstone core areas. The management direction will not be applied to these areas until they become occupied. In the meantime existing plan direction will be followed.

Information indicates the likely impact of projected vegetation management on connectivity in this area may not be excessive. Fuel treatment projects in unoccupied habitat would likely occur in no more than two to three percent of all lynx habitat on any forest in secondary areas (FEIS Vol. 1, p. 195, USDI FWS 2007). In unoccupied areas precommercial thinning could occur on about 67,000 acres (about 1 percent) with full funding and 23,000 acres (0.4 percent) or less with projected funding. Timber harvest in unoccupied areas could result in creating stand initiation openings in more than 30 percent of an LAU. However, very few LAUs exceed this amount now and those that were in excess were in that condition due to past wildfires (FEIS, Vol. p. 155). Information regarding projected timber harvest was not available, but based on the past harvest history (Project File/Forests/FEIS/Data) it is unlikely regeneration harvest will occur to the same levels it did historically (1970s and 1980s). Based on this, FWS found vegetation management, under existing plan direction, would not preclude connectivity or opportunistic foraging conditions (USDI FWS 2007).

Development is another factor that may impede lynx movement. Four ski areas, affecting about 3,800 acres occur on National Forest System lands, in unoccupied secondary habitat; two of the four are planning expansions. None of these ski areas impede connectivity of lynx habitat at this time (USDI FWS 2007).

Connectivity for lynx could be more impacted by development such as highway expansions. Under existing plans and national efforts, methods to provide for safe wildlife crossings are currently being researched by all state highway departments and are being incorporated into highway improvements (FEIS, Vol. 1 p. 294-295).

In secondary unoccupied habitat, units should consider the management direction until such time the area becomes occupied. Given the estimates of projected impacts and the best information available regarding lynx dispersal movements, FWS concluded that under existing plan direction, these unoccupied secondary areas would reasonably be

expected to provide adequate connectivity and opportunistic foraging habitat for lynx to allow dispersal (USDI FWS 2007).

Preliminary recovery objective 3: *Ensure habitat in secondary areas remain available for continued occupancy by lynx.*

FWS found the selected alternative contributes to this recovery objective in part.

The recovery outline discusses the relative importance of core and secondary areas to lynx recovery. The selected alternative will fully provide management direction in occupied lynx habitat – both core and secondary. This measure ensures habitat in currently occupied secondary habitat remains available for continued occupancy by lynx.

The forests should consider the management direction in currently unoccupied secondary habitat. As noted in Objective 3, management actions could adversely affect unoccupied secondary lynx habitat. If and when lynx attempt to establish home ranges in secondary areas, individual lynx could be affected. It is also important to note that about 70 percent of unoccupied secondary lynx habitat in the planning area is in roadless or wilderness status where forest management actions are minimal and natural processes predominate.

Occupancy could occur if lynx populations in core areas were to expand, as periodically happens in lynx populations in Canada. However, given the projected impacts described in Objective 3, non-developmental areas, and existing habitat conditions, FWS believes it is reasonable to expect some lynx would occupy these secondary areas despite lack of mandatory direction in plans, but at a lower density than core. Further, if detected, once lynx occupy a previously unoccupied area, the management direction will apply. In the meantime, our vegetation management actions may degrade lynx habitat, but resulting conditions are typically temporary, not permanent. The risks of most vegetation management actions, such as timber harvest, precommercial thinning and other modifications of habitat, are reversible since typically forests regenerate overtime, with or without active restoration. Based on this FWS found lynx habitat on National Forests System lands in secondary areas will likely remain available for recovery of lynx over time (USDI FWS 2007).

The Opinion goes on to say the selected alternative does not fulfill Objective 3 entirely, as it lacks requirements for further or continued monitoring or surveying of unoccupied secondary areas for the amount and condition of lynx habitat and lynx presence, as recommended in the recovery outline.

However, through this decision we agree to work with the FWS to develop and complete a protocol to survey and to develop a method to monitor the amount and condition of lynx habitat in unoccupied secondary habitat. Our agreement to these items will aid in fulfilling Objective 3.

Preliminary recovery objective 4: *Ensure threats have been addressed so that lynx populations will persist in the contiguous United State for at least the next 100 years.*

FWS found that although plans do not apply for 100 years and thus cannot directly fulfill this objective, the selected alternative will allow lynx populations to persist on lands within core areas in the planning area within the foreseeable future. The selected alternative addresses the threat to the distinct population segment (DPS), inadequate regulatory measures, within core areas in the planning area by limiting, reducing or avoiding major adverse impacts of federal land management on lynx, as well as several other impacts or influences that do not rise to the level of a threat to the DPS. Further, a large portion of lynx habitat within the planning area (67 percent) remains in non-developmental status, where natural processes predominate. Finally, unoccupied lynx habitat within secondary and peripheral lynx areas is likely to retain habitat that provides opportunistic foraging habitat and connectivity adequate for dispersal of lynx, despite the lack of specific direction for lynx habitat management (USDI FWS 2007).

Findings Required by Laws, Regulation, and Policies

National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires analysis of decisions to ensure the anticipated effects on the environment within the analysis area are considered prior to implementation (40 CFR 1502.16). The analysis for the Northern Rockies Lynx Management Direction followed the NEPA guidelines as provided by the Council on Environmental Quality. Alternatives were developed based on the Purpose and Need, the primary issues, public comments, lynx needs as identified by the LCAS, research, and other publications. A total of six alternatives were considered in detail, including the No Action Alternative as required by NEPA (FEIS, pp. 26 to 69 and 107 to 134). Additional management direction was considered but eliminated from detailed study (FEIS, pp. 71 to 106). The range of alternatives is appropriate given the scope of the proposal, the public issues expressed, and the Purpose and Need for action (FEIS, Chapter 1).

Unavoidable adverse effects

The selected alternative does not represent an irreversible or irretrievable commitment of resources. Any disturbance to resources cannot occur without further site-specific analyses, section 7a consultation required under ESA and decision documents. For a detailed discussion of effects of this decision, see Chapter 3 of the FEIS (pp. 135 to 350).

Environmentally preferable alternative(s)

Regulations implementing NEPA require agencies to specify "the alternative or alternatives which are considered to be environmentally preferable" (40 CFR 1505.2(b)). The environmentally preferable alternative causes the least damage to the biological and physical environments and best protects, preserves, and enhances historical,

cultural, and natural resources. Based on the description of the alternatives considered in detail in the FEIS and in this ROD, we determined the selected alternative best meets the goals of Section 101 of the NEPA, and is therefore the environmentally preferable alternative for this proposed federal action.

FWS found timber harvest can be beneficial, benign, or detrimental depending on harvest method, and the spatial and temporal occurrence on the landscape (FEIS, Vol. 1, Appendix P). The vegetation standards in the selected alternative ensure the timber management program is beneficial to lynx. Standard VEG S1 limits the amount of lynx habitat that is in the stand initiation stage to 30 percent of each LAU at any time, ensuring a continuous rotation of all forest stages through time that supply lynx habitat in each LAU (FEIS, Vol. 2, p. 60). Standard VEG S2 allows no more the 15 percent of the lynx habitat to change to the stand initiation stage through timber harvest in a 10-year period. This limits the rate of change within an LAU to ensure sufficient habitat for lynx through time.

Precommercial thinning can impact lynx habitat. Standard VEG S5 precludes precommercial thinning except in certain situations that FWS has determined would have little effect upon lynx or their habitat, but would advance natural ecological conditions (FWS comment letter on the DEIS, pp. 8 and 9). While these exceptions have little effect on lynx (0.5 percent of lynx habitat) they have important positive impacts on other resources and situations such as maintaining aspen, western white pine, and whitebark pine, and fuel reduction near buildings.

Since the LCAS was published it has become clear that multistory mature stands with dense horizontal cover are important to lynx. In the selected alternative, Standard VEG S6 is instrumental in maintaining winter snowshoe hare habitat in multistoried forests which will aid in lynx persistence.

The selected alternative allows for management of fuels in the WUI under Guideline VEG G10, rather than standards. Under VEG G10 fuel reduction projects in the WUI should consider the VEG standards, but may deviate from them, up to a cap of 6 percent of the lynx habitat on each National Forest. Lynx habitat is still considered; however, if the fuel reduction needs are such that any of the four VEG standards cannot be met while at the same time meeting fuel treatment objective, the project may proceed under Guideline VEG G10. Fuel treatment actions in 94 percent of the lynx habitat must follow the VEG standards, while at the same time fuel treatment projects in the WUI can protect other valuable resources.

The selected alternative contains guidelines for the various activities on National Forest System land that may have possible adverse affects on individual lynx. Standards were changed to guidelines when the best available information indicated the action was not likely to adversely affect lynx, or not likely to adversely affect lynx in most cases (i.e. where no conclusive or reliable information supported the standard in the LCAS).

The selected alternative contributes to lynx conservation and recovery on National Forest System lands, but allows for management of other resources. Considering all this, the selected alternative is the environmentally preferred alternative because it causes the least damage to the biological and physical environments and best protects, preserves, and enhances natural resources.

National Forest Management Act

Significance determination: The purpose of this proposal is to incorporate management direction into plans for the conservation and recovery of Canada lynx.

In January 2005, the Forest Service removed the November 9, 2000 National Forest System Land and Resource Management Planning Regulations at 36 CFR 219, subpart A and replaced them with newly adopted regulations. The new regulations set forth a process for land management planning, including the process for developing, amending, and revising land management plans (36 CFR 219.1). These regulations also incorporate effective dates and transition periods. Section 219.4(e) says "Plan development, plan amendments or plan revision initiated before the transition period (starting January 5, 2005) may continue to use the provisions of the planning regulations in effect before November 9, 2000" – in this case the 1982 regulations. This proposal was initiated on September 11, 2001, which is before the transition period; therefore it is being completed under the requirements of the 1982 regulations.

The National Forest Management Act (NFMA) provides that forest plans may be amended in any manner, but if the management direction results in a significant change in the plan, the same procedure as that required for development and approval of a plan shall be followed. The 1982 regulations at 36 CFR 219.10(f) requires the agency to determine whether or not a proposed amendment will result in a significant change in the plan. If the change resulting from the amendment is determined not to be significant for the purposes of the planning process, then the agency may implement the amendment following appropriate public notification and satisfactory completion of NEPA procedures.

Forest Service Manual (FSM) 1920, section 1926.5 (Jan. 31, 2006) identifies factors to consider in determining whether an amendment is significant or non-significant for those plans using planning regulations in effect before November 9, 2000.

Changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management.
2. Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities.

Examples of significant changes include:
1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected.
2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

The selected alternative will change in plans similar to examples of non-significant changes #1 and #3. The effects of this decision are not similar to either example of significant plan changes. These findings are discussed in further detail below.

Under the selected alternative the management direction will only apply to occupied habitat. At this time the Beaverhead-Deerlodge, Bitterroot, Nez Perce, Salmon-Challis, Ashley and Bighorn NFs are unoccupied; therefore these units should consider the management direction but will not have to apply it. Several mountain ranges on the Custer, Gallatin, Helena, and Lewis and Clark NFs are also unoccupied and the management direction will not have to be applied in these areas until lynx occupy the site. However, since the selected alternative could be applied to all units at some point in time, the following analyzes the effects on the planning area as a whole.

Changes in standards and guidelines are minor

The selected alternative adds one goal to forest plans; conserve Canada lynx. This goal is consistent with other goals in existing plans and other legal requirements to provide for habitat needs for threatened and endangered species. The selected alternative adds several objectives to the plans. These objectives require consideration of natural ecosystem process and functions, and consideration of lynx habitat needs. The additional objectives provide more species-specific guidance but do not alter the overall objectives to provide for habitat needs for threatened and endangered species. The proposal does not change any Management Area (MA) designation.

The selected alternative adds seven standards and twenty-four guidelines. The addition of these new standards and guidelines are minor as discussed below.

Changes would not significantly alter the long-term relationship between levels of multiple-use goods and services originally projected.

The management direction would not substantially alter outputs for grazing, minerals, energy, transportation systems, developed recreation areas, such as ski areas or winter recreation. These activities will not be prohibited by the management direction; however, habitat needs for lynx will need to be considered when managing these resources. The new direction will also not substantially alter timber outputs, even though it may affect growth and yield.

The selected alternative limits precommercial thinning in winter snowshoe hare habitat in young regenerating forests, with some exceptions – see Standard VEG S5. Precommercial thinning is allowed to restore aspen, whitebark pine and planted rust-

resistant western white pine. Precommercial thinning will also be allowed if new research indicates it will benefit or only have short-term adverse effects to lynx. Precommercial thinning is not allowed in young regenerating lodgepole pine forests, unless new research indicates it is beneficial or benign. Limiting precommercial thinning in lodgepole pine forests could affect growth and yield, and the potential to produce some products in the future, because these forests tend to stop growing if not thinned; however overall cubic foot volume would not be affected.

The Beaverhead-Deerlodge and the Bridger-Teton are the only units that have a majority of their precommercial thinning identified over the next ten years in lynx habitat and in lodgepole pine; therefore they are the only units that could see a reduction to growth and yield (FEIS, Vo1. 1, Appendix K-5). Under current programs, the units only have accomplished a portion of their thinning program (approximately 34 percent) due to budgets, so it is difficult to tease out the effects from the management direction in this proposal from effects of budgets. In addition, Standard VEG S5 allows for consideration of new information. Over the next ten to fifteen years information may become available that indicates some precommercial thinning in lodgepole pine forests may be beneficial to snowshoe hare (see DEIS comment letter #505).

Limiting precommercial thinning is unlikely to affect long-term sustained yield (LTSY), as defined by NFMA and FSH 1909.12, Chapter 60.5, because the cubic foot volume on the site does not substantially change. The volume is spread among more, smaller trees without thinning versus fewer, larger diameter trees with thinning. In addition, some precommercial thinning may be allowed in the future if new information becomes available. Timber outputs have never been at the level of LTSY over the life of these plans, so changes in LTSY are unlikely to lead to changes in outputs, especially if outputs are measured in cubic feet, which is the appropriate measure of LTSY.

In addition, the ASQ should not be affected on any units because the management direction does not preclude timber harvest. Standards VEG S1 and S2 may defer regeneration harvest in some areas, but Guideline VEG G1 encourages projects creating winter snowshoe hare habitat where it is lacking. It is likely there would be no change in overall timber outputs, but there may be changes in what material is harvested and where.

Changes would not have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

There are approximately 38.5 million acres within the 18 National Forests in the planning area. Of this, approximately 18 million acres or 48 percent has been mapped as lynx habitat (see table 3.1). Of the 18 million acres of mapped lynx habitat, approximately 8 million acres are in land allocations that allow for management actions. Therefore the management direction only potentially affects about 20 percent of the planning area. The most noticeable effects are likely to be the location and amount of precommercial thinning. The potential acreage that could be affected is between 11,000 to 15,000 acres per year. This is less than one percent of the planning area. It should be

noted that precommercial thinning is not constrained on an additional 18,000 acres per year outside lynx habitat (FEIS, Vol. 1 p 247-248).

Summary: Considering the three factors, we determined this management direction is not a significant change under NFMA to the 18 forest plans because it imposes minor changes over a limited area of these national forests.

While this amendment is not significant, the planning process necessary for significant amendments is ongoing or will begin soon on most units affected by this decision. In particular interest to the precommercial thinning discussion on the previous page, both the Beaverhead-Deerlodge and Bridger-Teton National Forests are being revised. The Beaverhead-Deerlodge should complete the revision process in 2007. Their DEIS for the Forest Plan recognizes the cumulative contribution the Northern Rockies Lynx Amendment may have on reducing growth and yield (DEIS, page 326). The Bridger-Teton should complete its revision in 2008.

Viability determination: This management direction is being adopted in accordance with the 1982 NFMA regulations for amending land and resource management plans. Plan amendments initiated before January 5, 2005 may proceed using the provisions of these regulations. The transition period to regulations implementing the 2005 planning rule ends on a unit's establishment of an Environmental Management System, or no later than January 7, 2008.

According to the 1982 NFMA regulations, fish and wildlife habitat shall be managed to maintain viable populations of Canada lynx in the planning area (36 CFR 219.19, 2000). For the purpose of this decision, the planning area is the range of lynx encompassed by the national forests subject to this decision. This is based on a biological delineation of the Northern Rockies made in the LCAS.

A viable population is, "one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well-distributed in the planning area." It is not possible to reliably predict future population demographics for lynx, and continued existence of lynx may be dependent on threats that exist outside of the planning area (health of Canadian populations, or linkage across other ownerships).

The national forests subject to this new direction will provide habitat to maintain a viable population of lynx in the Northern Rockies by maintaining the current distribution of occupied lynx habitat, and maintaining or enhancing the quality of that habitat. Based on the best scientific information available, and for the specific reasons provided below, this management direction will provide habitat to support persistence of lynx in the Northern Rockies in the long-term.

The LCAS was used as the basis for developing the selected alternative. The FWS Remand Notice (FEIS, Vol. 1, Appendix P), and other new information and research were also evaluated, and became the basis for updating standards and guidelines based upon the current state of knowledge regarding threats to lynx since the LCAS was compiled.

The greatest threats to lynx persistence and reproduction are from changes in vegetation structures that provide snowshoe hare habitat during summer and winter. Standards were developed under the selected alternative to provide direction for a variety of vegetation management activities that are most likely to affect lynx habitat (fuel treatments, precommercial thinning, timber harvest, etc.). These include standards for connectivity (ALL S1), habitat mapping (LAU S1), regeneration harvesting (VEG S2), precommercial thinning (VEG S5), and management of multistory mature and late successional forests (VEG S6). These standards are equal to or more protective than similar recommendations provided in the LCAS. In the Seeley Lake area of Montana, mature, spruce-fir forests with high horizontal cover are particularly important as winter foraging habitat and are more important than younger stands (Squires pers. com., Oct. 30, 2006) and the LCAS provides no specific management recommendations for these vegetative conditions within lynx habitat.

All of the core and secondary lynx habitat (100%) as defined in the *Recovery Outline* (USDI FWS 2005) that is occupied by lynx as defined in the *Occupied Mapped Lynx Habitat Amendment to the Canada Lynx Conservation Agreement* (USDA FS and USDI FWS 2006a) will be managed to conserve lynx.

The value of secondary habitat is unclear. The *Recovery Outline* (UDSI FWS 2005) states "Compared to core areas, secondary areas have fewer and more sporadic current and historical records of lynx and, as a result, historical abundance has been relatively low. Reproduction has not been documented." There currently is no evidence that suggest that unoccupied secondary habitat is considered necessary for a viable population of lynx. Secondary, unoccupied lynx habitat will have management direction implemented to conserve lynx if and when those administrative units become occupied. These National Forests (Beaverhead-Deerlodge, Bitterroot, Salmon-Challis and Nez Perce) which have secondary, unoccupied lynx habitat account for only about 30 percent of the total acres of core and secondary lynx habitat.

Even though the 6 percent limit (reflected in the vegetation standards) does not currently apply to unoccupied lynx habitat, those unoccupied forests would treat an average of 3.2 percent of lynx habitat within the WUI for fuel reduction over the next ten years (FEIS, Vol. 1, Lynx Section, and Appendix M). This is well below the 6 percent cap provided in the Biological Opinion (USDI FWS 2007). Overall fuel treatments, in and outside the WUI, in lynx habitat, average 5 percent within lynx habitat on these Forests.

In addition, The FWS Biological Opinion (2007) concluded that the proposed action is not likely to jeopardize the continued existence of lynx within the contiguous United States DPS. It also found the selected alternative will allow lynx populations to persist on lands in occupied core and secondary areas within the foreseeable future, and unoccupied secondary and peripheral habitat is likely to retain habitat that provides opportunistic foraging habitat and connectivity adequate for dispersal of lynx, despite the lack of specific direction for lynx management. The opinion goes on to say the

incorporation of the management direction over the large geographic area occupied by lynx within 12 of the 18 National Forests (12,150,000 acres) contributes to the landscape level direction necessary for the survival and recovery of lynx in the northern Rockies ecosystem.

Endangered Species Act

The Endangered Species Act creates an affirmative obligation ". . . that all federal departments and agencies shall seek to conserve endangered and threatened species" of fish, wildlife, and plants. This obligation is further clarified in a National Interagency Memorandum of Agreement (August, 2000) which states our shared mission is to ". . . enhance conservation of imperiled species while delivering appropriate goods and services provided by the lands and resources."

We completed biological assessments (BAs) for all listed species; one for wildlife and fish, and one for plants. For all listed species, except for Canada lynx, we determined the preferred alternative would have "no effect" or would be "not likely to adversely affect" them. The determination for Canada lynx was that, while the management direction in selected alternative would improve lynx conservation, the plans amended by selected alternative would still be "likely to adversely affect" lynx because individuals could be adversely affected as a result of the exemptions and exceptions to the vegetation standards for fuel treatments projects and precommercial thinning. The BAs were submitted to the FWS. The FS consulted with the FWS on the determinations and they concurred with the "no effect" and "not likely to adversely affect" determinations. The FWS provided written review as required by Section 7 of the ESA (USDI FWS 2007).

FWS issued a Biological Opinion on the "likely to adversely affect" determination on lynx (USDI FWS 2007). The opinion acknowledges the beneficial and adverse effects of the selected alternative. The opinion states that given the large number of acres covered by the proposed action, the existing plan language, and the beneficial effects of the management direction in the balance of these acres, the selected alternative is likely to have overall beneficial effects to lynx by addressing the primary threat identified at the time of listing: the inadequacy of existing regulatory mechanisms. Even acknowledging some adverse effects could still occur, primarily due to the allowance for fuel treatment projects and precommercial thinning, the opinion found the selected alternative is not likely to jeopardize the continued existence of Canada lynx. The Opinion identifies incidental take and reasonable and prudent measure, with associated terms and conditions to reduce take. These measures have either been incorporated into the management direction (TC 1, 2, and 3) or agreed to in this decision (TC 4).

Further section 7a consultation will occur on future site-specific projects and activities if they result in adverse affects to lynx. Future consultation will reference back to the BO issued on this decision to ensure the effects of the specific projects are commensurate with the effects anticipated in the opinion issued on this decision (USDI FWS 2007).

Critical habitat

On November 9, 2006, FWS published the final rule for the designation of Canada lynx critical habitat (Federal Register, Vol. 71, No. 217, pp. 66008 to 66061). National Forest System lands were not included in the critical habitat designation. There is no adverse modification to designated critical habitat from implementation of selected alternative.

National Historic Preservation Act

This decision is a programmatic action and does not authorize site-specific activities. Projects undertaken following the management direction will comply fully with the laws and regulations that ensure protection of cultural resources. It is our determination this plan direction complies with the National Historic Preservation Act and other statutes that pertain to the protection of cultural resources.

Clean Air Act

This decision is a programmatic action and does not authorize site-specific activities. Projects undertaken following the management direction will comply fully with the laws and regulations that ensure protection of air quality. It is our determination this plan direction complies with the Clean Air Act and other statutes that pertain to the protection of air quality.

Clean Water Act

This decision is a programmatic action and does not authorize site-specific activities. Projects undertaken following the management direction will comply fully with the laws and regulations that ensure protection of water quality. It is our determination this plan direction complies with the Clean Water Act and other statutes that pertain to the protection of water quality.

Invasive Species (Executive Order 13112)

Executive Order 13112 directs federal agencies not to authorize any activities that would increase the spread of invasive species. This decision is a programmatic action and does not authorize site-specific activities. We determined this plan direction complies with Executive Order 13112.

Environmental Justice (Executive Order 12898)

Executive Order 12898 directs federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. We determined from the analyses disclosed in the FEIS that this plan direction complies with Executive Order 12898.

Prime Farmland, Rangeland, and Forest Land

We determined from the analyses disclosed in the FEIS that prime farmland, rangeland, and forest land will not be affected by this decision because the selected alternative is a programmatic action and does not authorize site-specific activities.

Equal Employment Opportunity, Effects on Minorities, Women

The FEIS describes the impacts to social and economic factors in Chapter 3. The selected alternative will not have a disproportionate impact on any minority or low-income communities. We determined the selected alternative will not differentially affect the civil rights of any citizens, including women and minorities.

Wetlands and Floodplains (Executive Orders 11988 and 11990)

The selected alternative is a programmatic action and does not authorize site-specific activities. We determined the selected alternative will not have adverse impacts on wetlands and floodplains and will comply with Executive Orders 11988 and 11990.

Other policies

The existing body of national direction for managing National Forest System lands remains in effect.

Implementation and appeal provisions

The management direction will become effective 30 days after publication of the notice of availability of the FEIS in the Federal Register. Requests to stay implementation of the amended plans shall not be granted pursuant to 36 CFR 217.10.

This decision is subject to review pursuant to 36 CFR 217.3 (available at http://www.fs.fed.us/r1/planning/lynx.html). Any appeals must be postmarked or received by the Appeal Reviewing Officer within 45 days of the date the legal notices are published in the The Missoulian, the newspaper of record.

Appeals sent through the US Postal Service must be sent to:

USDA Forest Service
Attn: EMC Appeals
Mail Stop 1104
1400 Independence Ave., SW
Washington, DC 20250-1104

Appeals sent through FedEx, UPS, or a courier service must be sent to:

USDA Forest Service
Ecosystem Management Coordination
Attn: Appeals
Yates Bldg., 3CEN
201 14th Street, SW
Washington, DC 20250

Appeals may be hand-delivered to the above address during regular business hours, 8:00 AM to 4:30 PM Monday through Friday, excluding holidays; or sent by fax to (202) 205-1012; or by email to appeals-chief@fs.fed.us. Emailed appeals must be submitted in rich text format (.rtf) or Word (.doc) and must include the decision name in the subject line. Any notice of appeal must be fully consistent with 36 CFR 217.9 and include at a minimum:

- A statement that the document is a Notice of Appeal filed pursuant to 36 CFR Part 217;
- The name, address, and telephone number of the appellant;
- Identify the decision to which the objection is being made;
- Identify the document in which the decision is contained, by title and subject, date of the decision, and name and title of the Deciding Officer;
- Specifically identify the portion(s) of the decision or decision document to which objection is made;
- The reasons for the appeal, including issues of fact, law, regulation, or policy and, if applicable, specifically how the decision violates law, regulation, or policy; and
- Identification of the specific change(s) in the decision that the appellant seeks.

Further information and contact person

The Northern Rockies Lynx Management Direction FEIS, the Summary, this ROD and the FWS Biological Opinion, as well as other background documents are available on the Web at http://www.fs.fed.us/r1/planning/lynx.html.

For further information regarding the FEIS, ROD, or the plan direction for Canada lynx contact:

Timothy Bertram, Lynx Coordinator
USDA Forest Service, Northern Region
P.O. Box 7669
Missoula, MT 59807
Telephone: (406) 329-3611

I am the Responsible Official for incorporating the Northern Rockies Lynx Management Direction into the Land and Resource Management Plans for the Bighorn and Shoshone National Forests in the Rocky Mountain Region of the Forest Service.

Rick D. Cables — March 21, 2007

Rick D. Cables
Regional Forester, Rocky Mountain Region

Date

I am the Responsible Official for incorporating the Northern Rockies Lynx Management Direction into the Land and Resource Management Plans for the Ashley, Bridger-Teton, Targhee, and Salmon-Challis National Forests in the Intermountain Region of the Forest Service.

Jack G. Troyer
Regional Forester, Intermountain Region

March 23, 2007
Date

I am the Responsible Official for incorporating the Northern Rockies Lynx Management Direction into the Land and Resource Management Plans for the Beaverhead-Deerlodge, Bitterroot, Clearwater, Custer, Flathead, Gallatin, Helena, Idaho Panhandle, Kootenai, Lewis & Clark, Lolo, and Nez Perce National Forests in the Northern Region of the Forest Service.

Kathleen A. McAllister — March 23, 2007

Kathleen A. McAllister
Acting Regional Forester, Northern Region

Date

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ATTACHMENT 1

Northern Rockies Lynx Management Direction

The following management direction applies to all National Forest System lands that are known to be **occupied** by Canada lynx. At the time of this decision the following National Forests in the Northern Rockies lynx planning area are known to be occupied: Bridger-Teton, Clearwater, Custer, Flathead, Idaho Panhandle, Kootenai, Lolo, Shoshone, Targhee. Portions of the Custer, Gallatin, Helena, and Lewis & Clark are also occupied.

The following National Forests in the Northern Rockies lynx planning area are **not occupied** by Canada lynx: Ashley, Beaverhead-Deerlodge, Bighorn, Bitterroot, Nez Perce, Salmon-Challis. In addition, isolated mountain ranges on the Custer, Gallatin, Helena and Lewis and Clark are unoccupied – see Figure 1-1. Until such time as these National Forest System lands become occupied they should consider the following management direction, but are not required to follow it.

GOAL[14]

Conserve the Canada lynx.

ALL MANAGEMENT PRACTICES AND ACTIVITIES (ALL). The following objectives, standards, and guidelines apply to all management projects in lynx habitat in lynx analysis units (LAUs) 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[30] ALL O1

Maintain[26] or restore[40] lynx habitat[23] connectivity[16] in and between LAUs[21], and in linkage areas[22].

Standard[44] 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].

Guideline[15] 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[44] 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 within 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[30] 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[44] VEG S1

Where and to what this applies: 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 WUI[50] 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

Where and to what this applies: 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[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: Timber management[47] projects[36] shall not regenerate[38] more than 15 percent of lynx habitat on NFS lands within an LAU in a ten-year period.

Standard VEG S5

Where and to what this applies: 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:

1. Within 200 feet of administrative sites, dwellings, or outbuildings; or
2. For research studies[39] or genetic tree tests evaluating genetically improved reforestation stock; or
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[36] is not likely to adversely affect lynx; or
   b. that a project[36] 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[5] 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[51] is retained; or
6. To restore whitebark pine.

Exceptions 2 through 6 shall only be utilized in LAUs where Standard VEG S1 is met.

Standard VEG S6

Where and to what this applies: Standard VEG S6 applies to all vegetation management[49] projects[36] 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).

For fuel treatment projects[36] within the WUI[50] see guideline VEG G10.

The Standard: Vegetation management projects[36] that reduce snowshoe hare habitat in multi-story mature or late successional forests[29] 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 studies[39] or genetic tree tests evaluating genetically improved reforestation stock; or
3. 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 management[49] projects[36] 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[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 habitat[6].

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 projects[36] within 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 (LAUs) in occupied habitat. They do not apply to linkage areas.

Objective[30] GRAZ O1

Manage livestock grazing to be compatible with improving or maintaining[26] lynx habitat[23].

Guideline[15] 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 PROJETS (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 (LAUs) 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[30] 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 connectivity[16], and to reduce the potential of lynx mortality.

Guideline[15] 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 G5

For mineral and energy development sites and facilities that are closed, a reclamation plan that restores[40] lynx habitat should be developed.

Guideline HU G6

Methods to avoid or reduce effects on 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[36] 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[10], 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 compaction[1], 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[8] or designated over-the-snow routes[7].

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[30] 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 of adverse impacts on lynx and lynx habitat.

Standard[44] LINK S1

When highway[18] or forest highway[12] construction or reconstruction is proposed in linkage areas[22], identify potential highway crossings.

Guideline[15] LINK G1

NFS lands should be retained in public ownership.

Guideline LINK G2

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.

REQUIRED MONITORING

Map the location and intensity of snow compacting activities and designated and groomed routes that occurred inside LAUs during the period of 1998 to 2000. The mapping is to be completed within one year of this decision, and changes in activities and routes are to be monitored every five years after the decision.

When project decisions are signed report the following:

1. Fuel treatments:
    a. Acres of fuel treatment in lynx habitat by forest and LAU, and whether the treatment is within *or outside* the WUI as defined by HFRA.
    b. 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.
    c. Whether or not 2 adjacent LAUs exceed standard VEG S1 (30% 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.
2. *Application of exception in Standard VEG S5*
    a. 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 LAU) and whether or not Standard VEG S1 was within the allowance.
3. *Application of exceptions in Standard VEG S6*
    a. *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 LAU) and whether or not Standard VEG S1 was within the allowance.*
4. *Application of guidelines*
    a. Document the rationale for deviations to guidelines. Summarize what guideline(s) was not followed and why.

Directions in italics were terms and conditions that were incorporated from the FWS Biological Opinion (USDI FWS 2007).

GLOSSARY

[1] *Area 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 or 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 acreage or miles used during the period 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 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 during the period 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 FS, state transportation agency, and Federal Highway Administration.

[13] *Fuel treatment* – A fuel treatment is a type of vegetation management action that reduces the threat of ignition, 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.

[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 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 decision, 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 an aggregate surface. 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, level 5 roads are have double lanes and are 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 is 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 the 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 prescribed fire replaces the term 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] *Project* - All, or any part or number of the various activities analyzed in an Environmental Impact Statement, Environmental Analysis, or Decision Memo. For example, the vegetation management in some units or stands analyzed in an EIS could be for fuel reduction, and therefore those units or stands would fall within the term *fuel treatment project* even if the remainder of the activities in the EIS are being conducted for other purposes, and the remainder of those units or stands have other activities prescribed in them. All units in an analysis do not necessarily need to be for fuel reduction purposes for certain units to be considered a *fuel reduction project*.

[37] *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.

[38] *Regeneration harvest* – The cutting of trees and creating an entire new age class; an even-age harvest. The major methods are clearcutting, seed tree, shelterwood, and group selective cuts. (Helms, 1998)

[39] *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 NF budget.

[40] *Restore, restoration* – To restore is to return or re-establish ecosystems or habitats to their original structure and species composition. (Dictionary of Forestry)

[41] *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)

[42] *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.

[43] *Shrub steppe habitat* – Shrub steppe habitat consists of dry sites with shrubs and grasslands intermingled.

[44] *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.

[45] *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)

[46] *Stem exclusion structural stage (Closed canopy 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)

[47] *Timber management* – Timber management consists of growing, tending, commercially harvesting, and regenerating crops of trees.

[48] *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)

[49] *Vegetation management* – Vegetation management changes the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. For the purposes of this decision, 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.

[50] *Wildland urban interface (WUI)* – Use the definition of WUI found in the Healthy Forests Restoration Act. The full text can be found at HFRA § 101. Basically, the wildland urban interface is 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 if the terrain is steep, or there is a nearby road or ridgetop 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.)

[51] *Winter snowshoe hare habitat* – Winter snowshoe hare habitat consists of places where young trees or shrubs grow densely – thousands of woody stems per acre – and tall enough to protrude above the snow during winter, so snowshoe hare can browse on the bark and small twigs (LCAS). Winter snowshoe hare habitat develops primarily in the stand initiation, understory reinitiation and old forest multistoried structural stages.

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