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In Reply Refer To:

File: M.19 Custer Gallatin National Forest
06E11000-2020-F-0058

January 20, 2022

Mary Erickson, Forest Supervisor
Custer Gallatin National Forest
10 East Babcock Avenue
Bozeman, MT 59715

Dear Ms. Erickson,

Thank you for your request for consultation regarding effects of the proposed Custer Gallatin Land Management Plan (hereafter CG Plan) under Section 7 of the Endangered Species Act. The U.S. Fish and Wildlife Service (Service) has reviewed your biological assessment, additional information received from the Forest during consultation, and information in our files to assess the effects of the CG Plan on threatened, endangered, and proposed species that may be present on the Forest. Once signed, the CG Plan will provide management direction for the Forest. Site-specific evaluations will be conducted for individual activities authorized under the CG Plan at the time they are proposed, and consultation or conference would occur with the Service for such activities that may affect listed and proposed threatened and endangered species, as well as candidate species.

The biological assessments analyzed the effects of the CG Plan on the federally listed, proposed, and candidate species including: grizzly bear (*Ursus arctos horribilis*), Canada lynx (*Lynx canadensis*), lynx critical habitat, wolverine (*Gulo gulo luscus*), whitebark pine (*Pinus albicaulis*), northern long-eared bat (*Myotis septentrionalis*), whooping crane (*Grus americana*), and western glacier stonefly (*Zapada glacier*). The Forest made a determination that the CG Plan would have *no effect* on the western glacier stonefly, and *may affect, but is not likely to adversely affect* (NLAA) the northern long-eared bat and whooping crane. The Forest made a determination of *may affect, likely to adversely affect* (LAA) for grizzly bears, Canada lynx, and lynx critical habitat. The Forest also made a determination that the proposed action will not jeopardize the continued existence of wolverines and whitebark pine.

Since issuance of the biological assessment, the proposed rule to list wolverine has been withdrawn (October 13, 2020). Therefore, no further consultation related to wolverines is necessary.

Pursuant to the requirements of 7(a)(4) of the Act and 50 C.F.R. § 402.10, the Forest assessed the effects of their proposed action and made a no jeopardy determination for whitebark pine (a candidate species). We reviewed your biological assessment related to whitebark pine and we concur with your determination.

This document represents the findings required of the Service under section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. § 1531 et seq.) regarding the effects from the proposed action to species listed and critical habitat designated under the Act. We discuss and explain our findings below.

Whooping Crane

The breeding portion of the migratory population of whooping cranes nests in the Northwest Territories and adjacent areas of Alberta, Canada, and the cranes migrate southeasterly, stopping in southern Canada before continuing migration into the United States where they spend the winter months along 35 miles of the Gulf of Mexico coast (C.W.S. and U.S. Fish and Wildlife Service 2012). During migration, whooping cranes use a variety of habitats including croplands and palustrine wetlands. Areas characterized by wetland mosaics appear to provide the most suitable stopover habitat (U.S. Fish and Wildlife Service 2007).

The Service considers whooping cranes may be present in the far easternmost portion of the Custer Gallatin National Forest, in the Sioux Geographic Area (GA). This area is located in eastern Montana and western South Dakota and dominated by agricultural private lands surrounding parcels of higher elevation forested public land. The private agricultural lands provide the most suitable whooping crane roosting and foraging habitat for migrating whooping cranes on the GA. To date there have been no observations of whooping cranes within the GA, and due to the limited amount of potential suitable habitat, the potential for use of the Forest by migrating individuals or groups is low.

Given whooping crane habitat requirements and life history, the primary threat to whooping crane habitat on Forest Service managed lands would be the degradation of wetland or riparian habitats through management actions. The proposed Plan does not provide any standards, guidelines, or objectives specific to whooping cranes. However, elements of the Plan contain strategies to maintain and restore watershed, aquatic, and riparian ecosystems, and provide more detailed guidance compared to the current plans for these resources, which would have positive effects to habitat for whooping cranes. Specifically, the riparian management zone direction restricts management activities with few exceptions, to allow only those intended to restore, maintain or improve aquatic and riparian habitats (FW-STD-RMZ 02). The use of pesticides, herbicides, toxicants and other chemicals will only be allowed within riparian management zones if needed to maintain, protect, or enhance aquatic and riparian resources or to restore native plant communities (FW-STD-RMZ 03). Plan components would also limit the impacts to riparian areas from infrastructure management, including roads, buildings, and other structures. Thus, proposed Plan direction for riparian habitat management is expected to result in insignificant or discountable effects to whooping cranes.

Desired conditions and guidelines under the proposed Plan would maintain and restore potential migratory stopover habitats for whooping cranes by managing for intact grasslands and

maintenance or restoration of vegetation that could provide foraging and roosting habitat for cranes. The proposed plan includes desired conditions and objectives for wildland fires within the natural range of variation to maintain resilient ecological conditions (FW-DC-FIRE 01, FW-OBJ-FIRE 02), which would support natural disturbance processes that maintain healthy grassland and wetland communities, contributing to plant and animal diversity that would provide suitable foraging and resting conditions for whooping cranes. Guidelines and standards related to grazing management would minimize grazing management impacts to potential whooping crane foraging and resting areas (e.g. FW-GDL-GRAZ 01, 02, 04, 05). Thus, proposed CG Plan direction for vegetation and fire management would have insignificant effects or discountable effects to whooping cranes.

Human disturbance to migrating whooping cranes will be minimized by elements of the CG Plan related to infrastructure, recreation, and energy and minerals management. In addition, Plan components include a provision for wind energy developments to minimize impacts on birds (FW-GDL-WL 07), which would reduce risk of migrating whooping crane collisions with wind turbines. Thus, human use of the Custer Gallatin National Forest would have insignificant or discountable effects to whooping cranes.

Elements of the proposed CG Plan are designed to protect resources and habitats important to whooping cranes. Whooping cranes are unlikely to use the action area during the life of the CG Plan (discountable), but if they do, the effects of the Plan are expected to have insignificant effects to whooping cranes. Thus, the Service concurs with the Forest's determination that the proposed CG Plan is *not likely to adversely affect* the endangered whooping crane. The Service bases its concurrence on the information and analysis in the biological assessment and information in our files.

Northern Long-eared Bat

Northern long-eared bat (NLEB) may be present in the Sioux and Ashland GAs of the Forest; however, the species has not been documented anywhere on the Forest (as cited in BA, U.S. Forest Service 2020, p. 22). Potential habitat for NLEB includes ponderosa pine forests with smaller inclusions of deciduous trees, most notably cottonwood, aspen and green ash, found along streams and in woody draws. Live and dead trees provide potential summer roost sites, and even possible maternal roost sites for northern long-eared bats. Rimrock cliffs in the area are riddled with cracks, crevices and small holes, and there are a number of small, generally shallow caves in the Sioux and Ashland GAs that could also provide suitable summer roosting habitat for northern long-eared bats. Caves in the Sioux and Ashland GAs are not likely to provide suitable hibernacula for NLEB (BA, U.S. Forest Service 2020, p. 23).

White-Nose Syndrome (WNS) is the primary factor affecting the status of the NLEB, which has caused dramatic and rapid declines in abundance, resulting in the local extirpation of the species in some areas. Although other factors, individually or in combination, are likely insignificant at the range-wide scale, they may exacerbate the effects of WNS at the local population scale, thereby accelerating declines and the likelihood of local extirpation due to the disease or reducing the population's ability to survive and potentially rebound (U.S. Fish and Wildlife Service 2016).

The proposed CG Plan contains goals, standards, and guidelines to support the overall desired conditions for NLEB, which are that the "Custer Gallatin National Forest provides habitat that

maintains bat species diversity, and contributes to the long-term conservation of native bat species. Key habitats such as winter hibernacula and maternity roosts are free from human caused disturbance and introduced disease” (FW-DC-WLBAT 01). Because the primary threat to NLEB is transmission of white-nose syndrome, the proposed CG Plan requires all agency personnel and other authorized users such as contractors and volunteers to utilize established decontamination procedures prior to entering and upon leaving caves or abandoned mines known to be used as roost sites or winter hibernacula (FW-STD-WLBAT 01). In addition, guidelines designed to avoid potential disturbance of, and disease transmission to bats, guide new developed recreation sites such as roads, trails, campgrounds, picnic areas, or other features that concentrate human use, should not be placed within 0.5 mile of known bat hibernacula or maternal roost sites. As such, we do not anticipate adverse effects to bats related to human-caused transmission of disease.

The CG Plan also contains elements designed to protect caves and other hibernacula, (none of which have been found on the Forest to date). Plan components restrict management actions that could damage cave resources (FW-STD-EMIN 04-07). If bats are observed roosting in or on buildings, bridges, or other structures identified for removal or reconstruction, then demolition and construction activities should only occur once bats have left for the season. If facilities used by bats are to be removed and not replaced, then bat structures should be installed to compensate for habitat loss (FW-GDL-WLBAT 03). If a cave or mine needs to be closed for human safety or resource protection, the Forest will attempt to use closure devices that allow bats to continue using the cave or adit (FW-GDL-WLBAT 04). Because the occurrence of caves and hibernacula are rare to non-existent on the Forest, and the CG Plan contains measures to protect those resources if and when they are discovered, effects of the CG Plan on NLEB would be insignificant or discountable.

The best available data indicate that the NLEB shows a varied degree of sensitivity to forest management, including timber harvest and prescribed burning. These activities can cause direct effects if roost trees are altered or damaged while being used by bats, or indirect effects related to habitat alteration for roost sites, near hibernacula, or for foraging habitat (U.S. Fish and Wildlife Service 2016, p. 36-48). To reduce the impacts of vegetation management activities on roosting bats the proposed CG Plan includes guidelines to limit tree removal through mechanical means or prescribed fire within 0.25 mile of known bat winter hibernacula, and to not remove trees within 150 feet of known maternal roosts during the pup season (FW-GDL-WLBAT 01, 02). Because the occurrence of NLEB on the Forest is very rare, and because the CG Plan includes measures to minimize effects of vegetation management on bats if they are detected, the effects of the CG Plan to individual bats would be insignificant or discountable.

Elements of the proposed CG Plan are designed to protect resources and habitats important to NLEB. NLEB are unlikely to use the action area during the life of the CG Plan (discountable), but if they do, the effects of the Plan are expected to have insignificant effects to whooping cranes. Thus, the Service concurs with the Forest’s determination that the proposed CG Plan is *not likely to adversely affect* the endangered northern long-eared bat. The Service bases its concurrence on the information and analysis in the biological assessment and information in our files.

Summary and Reinitiation

We concur with your “may affect, not likely to adversely affect” determinations for the listed whooping crane and northern long-eared bat presented in the BA. This concurrence is based upon the action scope and location, and implementation of proposed conservation measures and Plan components listed and/or referenced in the BA. The proposed CG Plan does not authorize any future actions, but establishes the criteria all future projects must meet. Future projects under the CG Plan are subject to site-specific consultation.

As provided in 50 CFR § 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if:

- (1) the amount or extent of incidental take is exceeded;
- (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion;
- (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or
- (4) a new species is listed or critical habitat designated that may be affected by the action.

The attached stand-alone biological opinions address the effects of the Custer Gallatin Land Management Plan on grizzly bears and Canada lynx and designated critical habitat for Canada lynx.

The Service appreciates the Forest’s efforts toward conservation of threatened and endangered species as part of our joint responsibility under the Endangered Species Act. If you have questions or comments related to this consultation, please contact our office at the number above.

Sincerely,



Ben Conard,
Acting Office Supervisor

REFERENCES

- Canadian Wildlife Service and U.S. Fish and Wildlife Service. 2007. International recovery plan for the whooping crane. Ottawa: Recovery of Nationally Endangered Wildlife (RENEW), and U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 162 pp.
- U.S. Fish and Wildlife Service. 2012. 5 Year Review for Whooping Crane (*Grus Americana*) 5 Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Aransas National Wildlife Refuge, Austwell, Texas and Corpus Christi Ecological Service Field Office, Texas. 44 pp.
- U.S. Fish and Wildlife Service. 2016. Programmatic biological opinion on final 4(d) rule for the northern long-eared bat and activities excepted from take prohibitions. U.S. Fish and Wildlife Service Regions 2, 3, 4, 5, and 6. 109 pp.
- U.S. Forest Service. 2020a. Biological Assessment for Threatened, Endangered, Proposed and Candidate Species for the Revised Forest Plan for the Custer Gallatin National Forest. Revised BA dated May 15, 2020, received by email on June 15, 2020. Custer Gallatin National Forest, Bozeman, MT. 210 pp.
- U.S. Forest Service. 2020b. Draft 2020 Land Management Plan for the Custer Gallatin National Forest. Custer Gallatin National Forest, Bozeman, MT. 247 pp.

ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

BIOLOGICAL OPINIONS

on the

Effects of the Custer Gallatin Forest Plan on Threatened and Endangered Species



Action Agency: U.S. Department of Agriculture
Forest Service
Custer Gallatin National Forest
Bozeman, Montana

Consultation Conducted by: U.S. Fish and Wildlife Service
Montana Ecological Services Office
Helena, Montana

Date Issued: January 20, 2022

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Chapter I: INTRODUCTION

I.A. INTRODUCTION

The Gallatin National Forest and Custer National Forest were administratively combined in 2014 to form the Custer-Gallatin National Forest (Forest). Currently, each former administrative unit has its own Land and Resource Management Plan that is directing management on the separate parts of the combined Forest; the 1987 Gallatin National Forest Plan as amended in 2015 and the 1986 Custer National Forest Plan. Combining the Forests created a need to develop a single Land and Resource Management Plan for the entire administrative area as well as updating management direction due to changes in social, economic, and ecological needs and new scientific information that has become available since the current plans were developed.

Section 7(a)(2) of the Endangered Species Act (Act) states that each Federal agency shall, in consultation with the Secretary of the Department of the Interior, ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. The CG Plan is a framework programmatic action that in itself does not authorize, fund, or carry out any actions that directly affect any listed species or critical habitat. However, the CG Plan provides management direction for actions throughout the life of the plan that do have the potential to affect listed species and/or critical habitat. To address the uncertainty associated with the potential environmental consequences of plans, the US Forest Service and Bureau of Land Management signed a Memorandum of Agreement (MOA 2000) to consult with the Service and/or the National Marine Fisheries Service (NMFS) “so that future activities formulated and allowed under the parameters of the plan are not likely to jeopardize the continued existence of listed species or result in the destruction/adverse modification of designated critical habitat”.

In response to a request by the Forest, the Service provided a letter dated October 22, 2019 containing a current list of federally endangered, threatened, proposed, and candidate species and their designated critical habitat (when applicable) that may be present within the Forest boundaries. The Service updated the list on January 29, 2020 to include the change in status from ‘proposed’ to ‘threatened’ for the Western Glacier stonefly. Under the section 7 consultation process of the Act, the Forest analyzed and made determinations of effects for the CG Plan on all listed, proposed, and candidate species on the Forest (Table I-1).

In their letter dated March 5, 2020, the Forest provided a biological assessment on effects of the CG Plan to listed species and requested formal consultation on species the plan *may affect, and is likely to adversely affect*, requested written concurrence for species the CG Plan *may affect, but is not likely to adversely affect*, and requested conference concurrence on proposed and candidate species. This document provides the Service’s response for consultation on all federally endangered, threatened, proposed, and candidate species for the CG Plan. Our response is based on the biological assessment provided by the Forest, additional information provided by the Forest during consultation, and information in our

files. A complete project file of this consultation is on file at the Helena, Montana office of the Service.

Consultation on the CG Plan represents the first tier of a tiered consultation framework. Subsequent projects that may affect listed species and/or designated critical habitat that are analyzed within this programmatic biological opinion, as implemented under the CG Plan, are the second tier of consultation. When applicable, some second tier consultations may reference this programmatic biological opinion to ensure that effects of projects under consultation are commensurate with effects anticipated in this biological opinion and incidental take statement.

Table I-1. Federally endangered, threatened, proposed, and candidate species and their designated critical habitat (when applicable) that may be present within the Forest boundaries.

<i>Common Name</i>	<i>Scientific Name</i>	<i>Status</i>	<i>Effects Determination of the 2020 Forest Plan</i>
Western Glacier Stonefly	<i>Zapada glacier</i>	Threatened	No Effect
Whooping Crane	<i>Grus americana</i>	Endangered	May affect, not likely to adversely affect
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	May affect, not likely to adversely affect
Canada Lynx	<i>Lynx canadensis</i>	Threatened	May affect, likely to adversely affect
Canada Lynx Critical Habitat	n/a	n/a	May affect, likely to adversely affect
Grizzly Bear	<i>Ursus arctos horribilis</i>	Threatened	May affect, likely to adversely affect
Wolverine	<i>Gulo gulo luscus</i>	Proposed	Will Not Jeopardize
Whitebark Pine	<i>Pinus albicaulis</i>	Candidate	Will Not Jeopardize

I.B. CONSULTATION HISTORY

Informal consultation on the CG Plan began between the Forest and the Service in 2018. On March 6, 2020, we received the biological assessment (BA) and request for consultation on the effects of the CG Plan (U.S. Forest Service 2020a). We received a revised BA and errata on June 15, 2020. Further consultation and information exchange continued through email, meetings, and phone conversations with Forest staff.

The biological assessment, information in our files, as well as additional information and discussions throughout the informal and formal consultation process were used in the preparation of this biological opinion. A complete project file of this consultation is on file at our office.

I.C. DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the implementation of the CG Plan. The purpose of the CG Plan is to guide management toward the attainment of long-term desired conditions and communicate the concepts of strategic guidance and adaptive management for the Forest (U.S. Forest Service 2020b). The plan was developed in compliance with the National Forest System land management planning rule (36 CFR § 219). The 2012 Planning Rule specifies the following nine primary decisions that are to be made in Forest plans:

- Forestwide components to provide for integrated social, economic, and ecological sustainability, and ecosystem integrity and diversity, while providing for ecosystem services and multiple uses. Components must be within Forest Service authority and consistent with the inherent capability of the forest (36 Code of Federal Regulations 219.7 and §219.8–219.10).
- Recommendations to Congress (if any) for lands suitable for inclusion in the National Wilderness Preservation System and rivers eligible for inclusion in the National Wild and Scenic Rivers System (36 Code of Federal Regulations 219.7(c)(2)(v) and (vi)).
- The plan area’s distinctive role and contributions within the broader landscape.
- Identification or recommendation (if any) of other designated areas (36 Code of Federal Regulations 219.7(c)(2)(vii)).
- Identification of suitability of areas for the appropriate integration of resource management and uses, including lands suited and not suited for timber production (36 Code of Federal Regulations 219.7(c)(2)(vii) and 219.11).
- Identification of the maximum quantity of timber that may be removed from the forest (36 Code of Federal Regulations 219.7(c)(2)(ix) and 219.11 (d)(6)).
- Identification of geographic area or management area specific components (36 Code of Federal Regulations 219.7(d)).
- Identification of watersheds that are a priority for maintenance or restoration (36 Code of Federal Regulations 219.7(f)(i)).
- Plan monitoring program (36 Code of Federal Regulations 219.7 (c)(2)(x) and 219.12).

Forestwide components (referred to as plan components) are the primary decision of the CG Plan that guides future project and activity decision making and therefore have the greatest potential to influence listed species. As defined by the planning rule (36 CFR 219.7(e)), they are described below. Additional information on Plan Components and other decisions under the CG Plan is provided in the biological assessment and CG Plan.

Desired Conditions- A desired condition is a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined but must not include completion dates (36 CFR 219.7(e)(1)(i)).

Objectives- An objective is a concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonably foreseeable budgets (36 CFR 219.7(e)(1)(ii)).

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

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

Suitability of Lands- Specific lands within the Forest are identified as suitable for various multiple uses or activities based on the desired condition applicable to those lands. The plan identifies lands within the Forest as not suitable for uses that are not compatible with desired conditions for those lands. The suitability of lands are not identified for every use or activity. Suitability identifications may be made after consideration of historic uses and of issues that have arisen in the planning process. Every plan must identify those lands that are not suitable for timber production (§ 219.11). (36 Code of Federal Regulations 219.7(e)(1)(v)).

All plan components have a series of four alpha-numeric identifiers for reference, as described below;

- The first identifier indicates the level of direction (FW= Forestwide, for geographic area direction the geographic area abbreviation is used).
- The second identifier indicates the type of direction (DC = desired condition, OBJ = objective, GO = goals, STD = standard, GDL = guideline, SUIT = suitability, MON = monitoring question).
- The third identifier indicates the resource (e.g., WTR = Watershed, WL = wildlife).
- The fourth identifier is a unique number (numerical order starting with “01”) for each component within the constraints of the first three identifiers. For example, the first component for forest wide direction for desired conditions associated with wildlife would be identified starting with FW-DC-WL-01.

Plan components are referenced by their alpha-numeric identifiers throughout this document when discussing effects to listed species. All plan components referenced in this document are detailed in the proposed CG Plan (U.S. Forest Service 2020b). In particular, plan components specific to Canada lynx are found on p. 59, and components specific to grizzly bears are on p. 61-66. Other primary decisions required by the 2012 planning rule, such as recommended wilderness areas, are referenced as applicable for discussions of listed species.

I.D. TERM OF THE PROPOSED ACTION

Management direction in the revised forest plan will go into effect after the final record of decision is signed by the Forest Supervisor. The CG Plan is intended to provide management direction for approximately 15 years.

I.E. ACTION AREA

The action area is defined as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action” (50 C.F.R. § 402.02). It is based upon the geographic extent of the physical, chemical, or biological effects to land, air, and waters resulting from the proposed action, including direct and indirect effects.

The Forest boundaries encompasses approximately 3.4 million acres in multiple units extending approximately 400 miles across southern Montana from the Idaho border into northwest South Dakota (Figure I-I). The CG Plan designates six geographic areas (GA) on the Forest to direct management decisions towards different needs across the landscape and focus on specific circumstances in each geographic area. The action area encompasses all National Forest System lands within the administrative boundaries of the geographic areas. Land within the GAs Range from 65 percent to 98 percent under Forest jurisdiction (Table I-2). Remaining land in GAs is under private, state, tribal, or other federal jurisdiction.

Figure I-I. Custer Gallatin National Forest (dark green polygons) spanning parts of Montana and South Dakota, intermixed with multiple other ownerships.

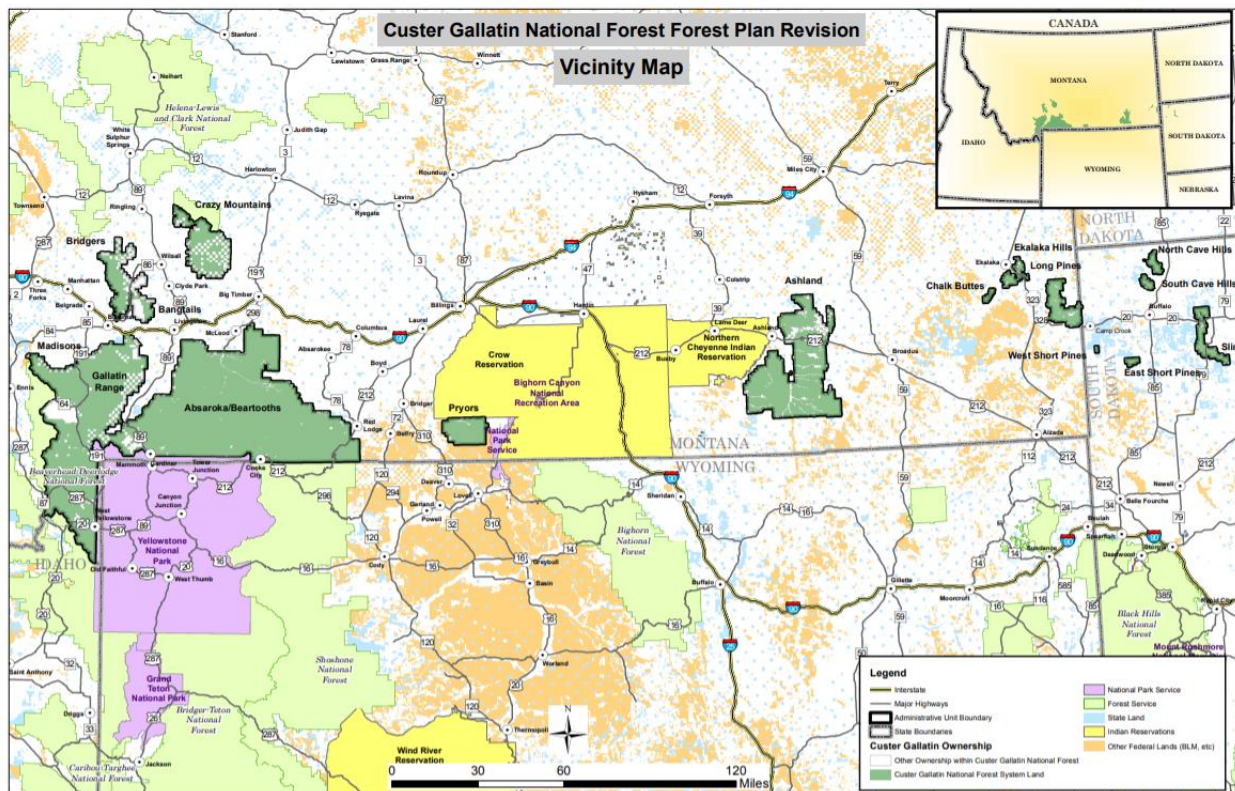
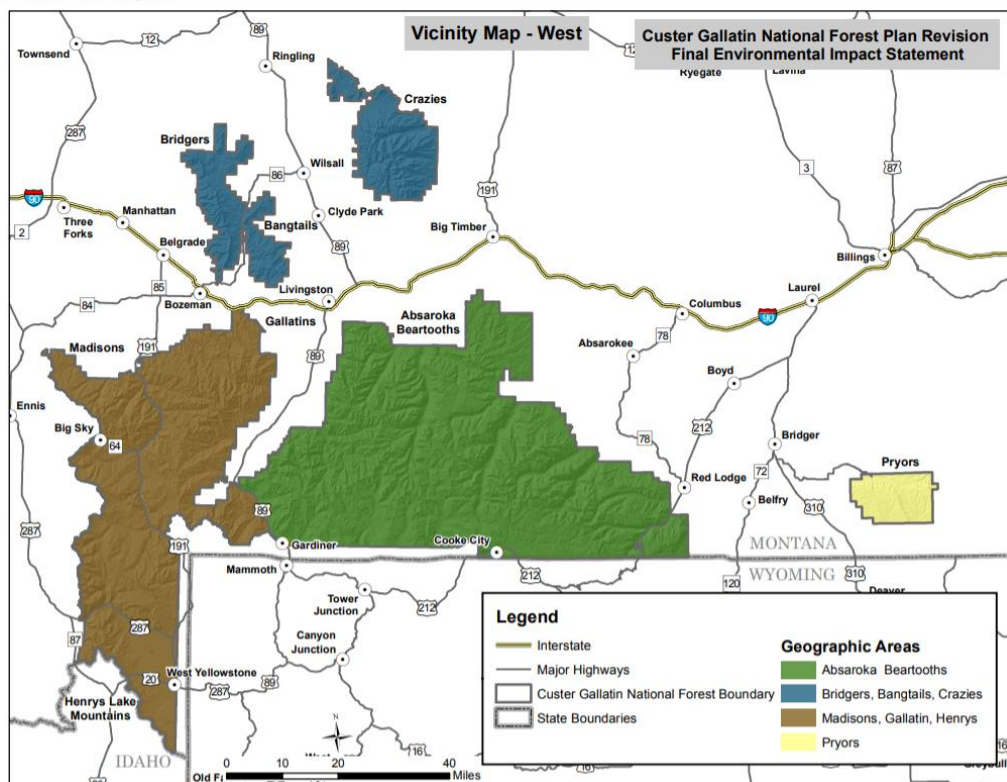
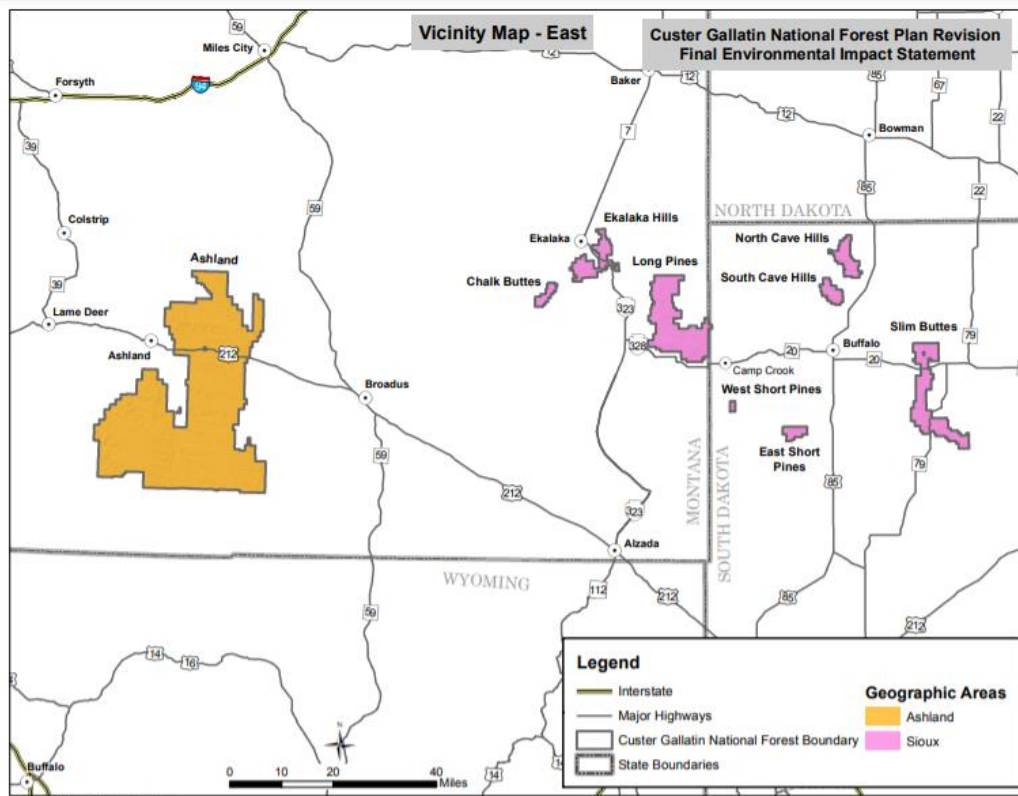


Table I-2. Total acres, acres under Forest jurisdiction, and percent of land under Forest jurisdiction for Geographic Areas (GA) delineated by the Forest in the Custer Gallatin Land Management Plan.

Geographic Area (GA)	Acres	Forest Acres in GA	% National Forest in GA
Madison, Henrys Lake and Gallatin Mountains (MHG)	953,001	806,615	85
Absaroka Beartooth Mountains (AB)	1,387,707	1,358,541	98
Bridger, Bangtail and Crazy Mountains (BBC)	314,598	205,148	65
Pryor Mountains (PM)	77,944	75,067	96
Ashland	501,797	436,134	87
Sioux	176,973	164,460	93
Totals	3,412,020	3,045,965	89

Figure I-1. Geographic Areas (GA) designated in the Custer Gallatin Land Management Plan.



I.F. ORGANIZATION OF THIS CONSULTATION

For species and critical habitat the Forest made a determination of *may affect, likely to adversely affect*, Section 7(b)(3)(A) of the Act requires that the Secretary of Interior issue biological opinions on federal agency actions that may affect listed species or critical habitat. Biological opinions determine if the action proposed by the action agency is likely to jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. Section 7(b)(3)(A) of the Act also requires the Secretary to suggest reasonable and prudent alternatives to any action that is found likely to jeopardize the continued existence of listed species or result in an adverse modification of any designated critical habitat. If the Secretary determines “no jeopardy,” then regulations implementing the Act (50 C.F.R. § 402.14) further require the Director to specify “reasonable and prudent measures” and “terms and conditions” necessary or appropriate to minimize the impact of any “incidental take” resulting from the action(s).

This biological opinion includes four chapters. This is the introductory Chapter I, which provides a description of the proposed action. This section describes the project area, the species in the project area, and an overview of the proposed Custer Gallatin Land Management Plan (CG Plan). Chapter II contains the biological opinion for Canada lynx and its designated critical habitat, and Chapter III contains the biological opinion for grizzly bears. The species-specific chapters (i.e., Chapters II and III) provide additional description of the proposed action relative to measures contained in the CG Plan to address the conservation needs of the species. Each species-specific chapter contains its own incidental take statement and literature cited.

The CG Plan covers a wide range of activities that may occur on the Forest and all listed species do not occur in all GAs on the Forest. Each species section indicates the GAs on the Forest the species may be present. Effects from management direction of the CG Plan are addressed by management categories (e.g. vegetation management, access management, etc.) relevant to the species rather than attempting to address activities individually for all species.

I.G. LITERATURE CITED

U.S. Forest Service. 2020a. Biological Assessment for Threatened, Endangered, Proposed and Candidate Species for the Revised Forest Plan for the Custer Gallatin National Forest. Revised BA dated May 15, 2020, received by email on June 15, 2020. Custer Gallatin National Forest, Bozeman, MT. 210 pp.

U.S. Forest Service. 2020b. Draft 2020 Land Management Plan for the Custer Gallatin National Forest. Custer Gallatin National Forest, Bozeman, MT. 247 pp.

Chapter II: CANADA LYNX AND ITS DESIGNATED CRITICAL HABITAT

II.A. BIOLOGICAL OPINION FOR CANADA LYNX

II.A.1. Status of the Species

On January 11, 2018, the U.S. Fish and Wildlife Service (Service) announced the completion of a Species Status Assessment (SSA) for the Canada lynx contiguous United States Distinct Population Segment (DPS). The SSA provides a scientific review of the Canada lynx and compiles the best available scientific information regarding the historical, current, and potential future conditions for lynx in the lower 48 states. It is an extensive review of the best available scientific information and almost 20 years of working in partnership with state, federal, tribal, industry and other land managers on the conservation of this species. Refer to the SSA for information on the status of Canada lynx, including but not limited to species description, life history, and status and distribution (U.S. Fish and Wildlife Service 2017a). The SSA evaluates the DPS's viability considering climate change, forest management and related regulations, wildland fire management, and other potential sources of habitat loss and fragmentation. The SSA incorporates information from the Canada lynx expert elicitation workshop (Lynx SSA Team 2016), which addresses the current and future status of, potential threats to, and likely viability of resident lynx populations throughout the DPS.

The Canada lynx conservation assessment and strategy (LCAS), 3rd edition (Interagency Lynx Biology Team 2013), is another source of best available scientific information that provides a thorough review of lynx and lynx management. In addition, the following listing documents also include information on the status of Canada lynx: the final rule listing lynx as a threatened species (65 FR 16052); the remanded determination in our clarifications of findings of our final rule (68 FR 40076); and the 2014 revised final rule designating lynx critical habitat (79 FR 54782). Finally, the 2007 biological opinion (U.S. Fish and Wildlife Service 2007) and associated 2017 amended incidental take statement (U.S. Fish and Wildlife Service 2017b) on the effects of the Northern Rockies Lynx Management Direction (NRLMD) on the Distinct Population Segment of Canada lynx (lynx) in the contiguous United States also includes detailed discussions on the status of lynx. These documents include the best available science regarding the status and distribution of lynx and are incorporated by reference.

II.A.2. Analysis of the Species Likely to be Affected

The biological assessment determined that the CG Plan would likely adversely affect individual Canada lynx. Therefore, formal consultation with the Service was initiated and this biological opinion has been written to determine whether or not activities associated with this action are likely to jeopardize the continued existence of Canada lynx. Lynx are listed as threatened under the Act.

II.A.3. Environmental Baseline

Under the provisions of section 7(a)(2), when considering the “effects of the action” on listed species, the Service is required to consider the environmental baseline. Regulations implementing the Act (50 C.F.R. § 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in progress. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency’s discretion to modify are part of the environmental baseline.

The Forest provided information in the BA showing boreal forest conditions that provide lynx habitat are found in the montane ecosystem on the Custer Gallatin National Forest, which includes the following Geographic Areas (GAs): Madison, Henrys Lake and Gallatin Mountains (MHG); Absaroka Beartooth (AB); Bridger, Bangtail and Crazy Mountains (BBC); and the Pryor Mountains (PM). Therefore, the montane ecosystem was used as the analysis area for lynx and lynx habitat. Together these four GAs encompass 2,733,250 acres, of which 2,445,372 acres are National Forest System (NFS) lands. Although within the action area, the inholdings of ownerships other than the Forest are not included in the total acreages above and are not subject to Forest management. Figure 1 and Table 2 in the terrestrial biological assessment display the GAs spatially and provided the acreages by ownership (U.S. Forest Service 2020).

In order to fully address effects of the CG Plan, the Forest provided lynx habitat information at the GA scale. The information provided consists of a broad scale estimate of lynx habitat across the Forest intended to provide an overall picture of the current status of lynx habitat (Appendix 3 of the BA).

The Forest is divided into 25 lynx analysis units (LAUs) - 13 in the AB, 9 in the MHB, 3 in the BBC, and 1 in the PM. The Forest is not changing any of its LAU boundaries with the CG Plan. As they have been in the past, LAUs will be used to analyze effects to lynx at the site-specific, project scale. LAUs are typically large enough to represent the average home range size of a female lynx and contain adequate habitat and landscapes to support lynx year-round, providing a sufficient landscape to assess the effects of site-specific projects on individual lynx but not so large as to dilute the potential effects of an action. LAU boundaries are not to be adjusted for individual projects, but must remain constant to be effective for their intended purposes of planning and monitoring (ILBT 2013).

II.A.4. Status of the Species within the Action Area

Only a portion of the Custer Gallatin National Forest falls within the area where lynx may be present (U.S. Fish and Wildlife Service 2016). This includes three of the GAs identified by the Forest: (1) Madison, Henrys Lake and Gallatin Mountains (MHG); (2) Absaroka Beartooth (AB); and (3) Bridger, Bangtail and Crazy Mountains (BBC). These GAs are located within the Greater Yellowstone Area (GYA) geographic unit, one of six geographic units evaluated in the Species Status Assessment (SSA) for Canada lynx (U.S. Fish and Wildlife Service 2018, p. 2).

Based on verified records, it is uncertain if the GYA (Unit 5) historically supported a persistent resident lynx population or if it only supported resident lynx ephemerally (U.S. Fish and Wildlife Service 2018, p. 111-112). No lynx have been verified in this unit since 2010, but whether this indicates the extirpation of a small but previously persistent resident population or the temporary loss of a historically ephemeral population is uncertain. This unit lacks geographic connectivity to other units, and potential habitat for lynx is naturally marginal (patchier and composed in many places of drier forest types), with fewer shrubs and a more open understory, and generally very low to marginal hare densities, resulting in a spatially-limited distribution of lynx with large home ranges (Ibid. p. 154). Past timber harvest and associated management (thinning, road construction, fire suppression) appear to have had localized impacts but not to have diminished the unit's ability to support resident lynx (Ibid. p. 112). This was the only unit for which most experts believed the current probability of persistence is low (i.e., that it is uncertain whether this area currently supports a resident lynx population).

There are very few verified lynx records in the GYA from 1920-1999, but several resident lynx and evidence of reproduction were verified in the late 1990s and early 2000s (around the time the DPS was listed). In addition, at least 9 radio-marked lynx released in Colorado dispersed northward into or through this unit from 2003-2010, but no lynx have been detected in the GYA since 2010 (U.S. Fish and Wildlife Service 2018, p. 9). Most places surveyed in Yellowstone National Park had hare densities clearly too low to support resident lynx. However, parts of the Wyoming Range south of the park, where many historical and most recent occurrences in this unit have been concentrated, had hare densities among the highest documented in the DPS range. No population estimates are available, but expert opinion suggests that this unit may only support 0-10 lynx, and we find no reliable evidence that it once supported a larger or persistent resident population.

Total documented lynx occurrences on the Forest are rare. The most recent in 2009, which involved a single female lynx (verified by DNA testing) that had been tracked in the Mill Creek Drainage of the AB Geographic Area for six consecutive years. There was no evidence of any other *resident* lynx on the Forest during that timeframe, nor has there been any documented occurrences since (as cited in BA). A few *transient* lynx may have spent some time on the Custer Gallatin National Forest as they dispersed northward out of Colorado (Ivan 2012, U.S. Forest Service 2021, p. 33).

Table II-1. Lynx habitat categories by geographic area (GA) on the Custer Gallatin National Forest.

Geographic Area (GA)	Occupied	Type	Critical Habitat
Absaroka Beartooth	Yes	Core	Yes
Madison Henrys Lake Gallatin	Yes	Secondary*	Yes
Bridger Bangtail Crazy	No	Secondary	No
Pryor Mountains	No	Peripheral	No
Ashland	No	Not Applicable	No
Sioux	No	Not Applicable	No

* Table 3 in the BA erroneously classified the MHG GA as Core and Secondary

The Recovery Outline for Canada Lynx (USDI FWS 2005) categorizes lynx habitat in the continental U.S. as “core”, “secondary,” or “peripheral” based on historic and current occupation by lynx. Core areas have verified records of lynx presence over time and recent evidence of reproduction. According to that document, the AB and MHG contain Core areas for lynx, while the BBC is Secondary and PM is Peripheral. Secondary Canada lynx habitat or a ‘secondary area’ and peripheral areas are defined in the Canada Lynx Recovery Outline (U.S. Fish and Wildlife Service 2005) and revised LCAS (Interagency Lynx Biology Team 2013). Both secondary and peripheral areas lack evidence of lynx reproduction. These areas have sporadic historical records of lynx, generally corresponding to cyclic population highs in Canada and might contribute to lynx persistence by supporting successful dispersal or exploratory movements. Habitat in these areas appears to be inherently patchier and less productive and likely only support lynx intermittently. The LCAS indicates that the focus of management in secondary areas is on “providing a mosaic of forest structure to support snowshoe hare prey resources for individual lynx that infrequently may move through or reside temporarily in the area” and that landscape connectivity should be maintained to allow for movement and dispersal. The LCAS further speculates that “the amount and quality of habitat required to support an independent adult or subadult disperser is less than is necessary to support reproduction and sustain a local population” (Ibid). The Ashland and Sioux GAs do not have any habitat for lynx, and are not considered further in this analysis.

The Northern Rockies Lynx Management Direction (NRLMD; USDA 2007) provided classification of whether lynx habitat is designated as occupied per the 2006 Amended Conservation Agreement and NRLMD (USDA FS and USDI FWS 2006, USDA 2007). According to those documents, the AB and MHG GAs are designated as occupied, even though lynx may not be detected in these areas for periods of time, and no lynx have been documented on the Forest for at least ten years. The BBC and PM GAs contain potential lynx habitat, but are designated unoccupied. Although unoccupied areas may have occasional transient use by lynx traveling between more suitable areas, such use is believed to be rare. Henceforth, the terms “occupied” and “unoccupied” used in reference to lynx habitat indicate areas designated as such in the NRLMD (Ibid).

Lynx habitat can be further categorized into specific types of habitat. Snowshoe hare habitat (lynx foraging habitat) is generally comprised of young forests in a stand initiation stage and

older, multi-story forests. Early stand initiation stands are very young regenerating stands characterized by a gradient of no trees to a dense growth of young trees that provide abundant forage and hiding cover for snowshoe hare during the summer. In the winter, these stands are covered by snow and unavailable to snowshoe hares. As they age, these stands often transition into stand initiation phase, where trees have grown tall enough to protrude above the snow, and provide forage and dense hiding cover for snowshoe hares in the winter and summer. Multi-story forests with dense horizontal cover (a dense understory of young trees and shrubs) provide both lynx and snowshoe hares with abundant forage and hiding cover during summer and winter. Summer habitat is not believed to limit snowshoe hare or lynx populations. However, winter habitat is believed to be a factor limiting snowshoe hare and lynx populations (Squires et al 2010, Interagency Lynx Biology Team 2013).

Stands of trees with a relatively closed overstory canopy and limited understory vegetation are characterized as stem exclusion habitat. These phases are forest successional stages that are part of the boreal forest landscape. Little light reaches the forest floor so understory vegetation (including trees) are shaded and grow slowly; shrubs become dormant and new trees are precluded by a lack of sunlight and/or moisture. Thus, these structural stages do not currently provide snowshoe hare habitat due to the lack of horizontal cover. In some stem exclusion stands, a limited amount of snowshoe hare forage may be available during the summer as a greater variety and quantity of deciduous forage and cover is available to hares due to the lack of snow cover and the growth of seasonal vegetation. This summer understory habitat is covered by snow during the winter and is unavailable to hares or lynx.

Lynx den sites are generally found in mature spruce-fir forests among downed logs or root wads in areas with abundant coarse woody debris and dense understories with high horizontal cover. Downed trees provide cover for den sites and kittens and are often associated with dense woody stem growth. The structural components of lynx den sites are common features in both managed and unmanaged stands. Because lynx have large home ranges and low den site fidelity, most lynx populations are not limited by a lack of immediate den sites (Squires et al. 2008).

Fire and other natural disturbance processes, both currently and historically, played an important role in maintaining a mosaic of forest successional stages that provides habitat for both snowshoe hare and lynx (Ruediger et al. 2000, Interagency Lynx Biology Team 2013). Fire regimes are variable, having both frequent (35-100 years) stand-replacing or mixed severity fires and infrequent (200+ years) stand replacement fires. Within the past 70 years, land management agencies began effective fire suppression with the advent of aircraft support. Fire exclusion has the potential to alter vegetation mosaics and species composition that may reduce the quality and/or quantity of lynx habitat. In western forests, fire exclusion in areas with a history of infrequent fire return intervals has probably not had much impact. But areas where the fire regime was historically frequent or mixed has generally shifted to more intense fire regimes, resulting in forest compositions and structures that are more homogeneous, composed of more shade-tolerant species with more canopy layers, and are more susceptible to severe fires, insects, and diseases.

The Custer Gallatin National Forest mapped potential lynx habitat across the Forest, following lynx habitat mapping recommendations originally outlined in the Lynx Conservation Assessment and Strategy (LCAS; Ruediger et al. 2000), and adopted as direction in the NRLMD (USDA 2007). The BA provides information and cites the mapping process defined in Canfield (2016), which intended to develop reliable, consistent lynx habitat mapping and modeling protocols (BA, USDA 2020, p. 35-38). Due to a lack of local data on lynx habitat use, lynx habitat characteristics used for the Custer Gallatin were derived from research on lynx in other areas, including, but not limited to, northwest Montana.

In the BA, the Forest explains that they identify lynx habitat by first identifying potential vegetation types that could provide lynx habitat, then categorizing those areas based on current structural stages. The Forest anticipates structural stages within lynx habitat will change regularly over the course of the Plan, as stands grow into other successional stages, or natural or human-induced disturbances change the structure of stands. Therefore, we anticipate the Forest will update information related to structural stages in lynx habitat on a periodic basis to reflect the current conditions, and that this information is not new nor will it change any of the assumptions in our analysis, but will rather provide contemporary depiction of the conditions on the landscape for lynx at the time.

Olson et al. (2021) recently developed and published an empirical habitat distribution model for lynx across the northwestern United States. Their model predicts relatively low habitat capability across most of the Custer Gallatin National Forest, and indicates substantially less potential habitat for lynx on the Forest than what is predicted in the BA based on the Forest's current mapping methods. The Olson et al. (2021) habitat capability model is currently being reviewed by the Western Lynx Biology Team, which is having ongoing conversations regarding the application of this new information to management of lynx habitat. Because no decisions or updated recommendations have come from the team yet, the Forest does not intend to start using the Olson et al. (2021) model to guide lynx habitat management at this time, but will continue using the mapping methods described in the BA to identify lynx habitat for the purposes of applying NRLMD standards and guidelines to lynx habitat management. Because the Forest's mapping methods likely err on the side of being more inclusive rather than exclusive of lynx habitat (compared to what the Olson model indicates), use of the Forest's mapping is conservative in favor of lynx.

If the Forest chooses in the future to re-map lynx habitat or adopt the Olson et al. model, the Forest should contact the Service to determine whether the new information reveals effects not previously considered that would trigger the need to reinitiate consultation on the Plan.

The Forest reports that within the four GAs with lynx habitat, the total amount of lynx habitat within the GAs ranges from 18 percent to 60 percent of the GA. Table 6 and Appendix 3 of the biological assessment (BA; U.S. Forest Service 2020) display the amount of potential lynx habitat by GA and LAU, respectively, based on the mapping methods described in the BA. These tables also display the amounts of lynx habitat in different structural stages, and the amount of non-habitat that does not have potential to develop into lynx habitat. The acres displayed in Table 6 and Appendix 3 of the BA are broad scale estimates intended to provide an overall picture of the current status of lynx in the action area and do not represent the level of precision necessary for project level analyses. These are the estimated current conditions. The proportions of habitat in various structural stage categories is expected to change over time as a

result of succession and forest growth as well as changes related to disturbances such as fire, harvest, pre-commercial thinning, and insect infestations. However, the proportion of the GAs that are lynx habitat versus non-lynx habitat remains relatively constant over time.

II.A.5. Factors Affecting Species Environment within the Action Area

This section identifies and describes key areas of Forest management that affect the environment for lynx. These factors include vegetation management (including fire management), livestock management, human use, and linkage areas. Existing management related to these factors is summarized below. The biological assessment provides additional information on the existing condition related to the following factors and is incorporated by reference (U.S. Forest Service 2020).

On March 23, 2007, the Service issued a biological opinion and incidental take statement on the effects of the NRLMD on the Distinct Population Segment of Canada lynx (lynx) in the contiguous United States (U.S. Fish and Wildlife Service 2007), in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The Service determined that the NRLMD was not likely to jeopardize lynx (*Ibid.*). The NRLMD was amended to both the Custer and Gallatin National Forest's plans and is the current lynx direction in both plans. In 2017, the Service issued an amended incidental take statement, which included a five-year extension of the time-frame to implement the NRLMD.

The NRLMD applies to occupied, mapped lynx habitat within LAUs on the Forest. An area is considered occupied when at least two observations or records are verified since 1999, unless they are verified to be transient individuals, or if evidence of reproduction occurs. The Absaroka Beartooth (AB) and Madison Henrys Lake Gallatin (MHG) GAs, are considered occupied while the Bridger Bangtail Crazy (BBC) and Pryor Mountains (PM) GAs, along with the Ashland and Sioux, are unoccupied (Table II-1).

The NRLMD provides direction primarily for lynx habitat management to avoid or reduce the potential for projects proposed under Forest Plans to adversely affect lynx. The direction accomplishes this through a suite of standards and guidelines that reduce or avoid adverse effects on lynx from land management activities primarily by reducing or avoiding adverse effects on lynx habitat that provides snowshoe hare habitat (lynx foraging habitat). Thus, the NRLMD promotes and conserves the habitat conditions needed to produce snowshoe hare (lynx primary prey) densities that are adequate to sustain lynx within their home ranges, and thus sustain lynx populations and promote recovery of Canada lynx. Some exemptions and exceptions to avoiding adverse effects to lynx may occur within the wildland urban interface (WUI) to protect human safety and property or for activities for other resource benefits and are described below.

Vegetation Management

Vegetation management includes activities that change the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest.

Harvesting has been used within the action area as a tool to achieve a variety of resource objectives, including but not limited to lowering fuels and fire risk; establishing desired tree species; improving tree growth; reducing impacts of insects or disease; contributing wood products to the local economy; improving wildlife habitat; and salvaging the economic value of trees killed by fire or other factors. Under the existing Forest plans, the area suitable for timber production (also referred to as the “suitable base”) includes about 17 percent of the National Forest System acres in the montane geographic areas, where lynx may be present (Table II-2). Actual use on the ground is constrained by resource-specific standards and guidelines, including the NRLMD.

Table II-2. National Forest System (NFS) lands classified as suitable for timber production under the existing Forest Plans and the proposed Custer Gallatin National Forest Land Management Plan.

Lynx Habitat Category	Total Acres NFS Lands	% of NFS Lands Suitable for Timber Production under existing Plans	% of NFS Lands Suitable for Timber Production under CG Plan
Occupied	2,165,156	14%	12%
Unoccupied	280,215	33%	23%
Total	2,445,372	17%	13%

The vegetation management standards and guidelines in the NRLMD work together to promote the vegetation management objectives. Based on the best available information, the Service concluded that the NRLMD would conserve the most important components of lynx habitat: a mosaic of early and mature multi-story forests with high levels of horizontal cover and structure (i.e. snowshoe hare habitat). These components ensure habitat that maintains its inherent capability to support both snowshoe hare prey base and adequate lynx foraging habitat and denning habitat. As the NRLMD will be carried over unchanged, the effects of the baseline condition will be very similar to the effects of the CG Plan. Thus, a detailed analysis of the NRLMD will be provided in effects section below.

The NRLMD standards and guidelines are applicable and required for all vegetation management actions in occupied, mapped lynx habitat within the action area. The NRLMD standards and guidelines are to be *considered* in habitat identified as unoccupied but are not *required*. To date, the Forest has applied the standards and guidelines to all vegetation management projects in all mapped lynx habitat regardless of occupancy status.

As analyzed below, areas within the WUI are exempt from the standards; however Guideline VEG G10 would apply and requires consideration of the standards in designing fuel treatment projects. Collectively, application of the vegetation management standards and guidelines avoids most adverse effects to lynx. For the purposes of the NRLMD, vegetation management 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 wildland fire use.

The NRLMD includes exemptions from Standards VEG S1, VEG S2, VEG S5, and VEG S6 to allow for fuel treatment projects within the WUI. In addition, exceptions listed in VEG S5 and VEG S6 would allow some activities for other resource benefit such as to protect structures, for research, and/or to promote the conservation of tree species such as whitebark pine and aspen. These exemptions and exceptions would allow actions that may have adverse effects on lynx by reducing the horizontal structure of natural forest succession phases, and/or affecting the mosaics of the forested landscape in localized areas, thus, effecting snowshoe hare habitat.

The Forest Service provided explicit estimates on the maximum number of acres of lynx habitat that could be adversely impacted under the exemptions and exceptions. In our 2007 programmatic biological opinion, we analyzed the effects of such impacts on lynx. In our 2017 amended incidental take statement, we updated these estimates. The Custer and Gallatin portions of the Forest were listed separately because the two forests were administratively separate at the time of the 2007 consultation. Since 2007, several site-specific projects have been analyzed through the section 7 consultation process and the effects analyses were tiered to the 2007 biological opinion and associated incidental take statement. These projects are in various stages of completion, with some completed and other not yet fully implemented, but consulted on. These projects have been considered in the baseline condition for the CG Plan and are represented in the acres described below.

In 2017, the Custer portion of the Forest was estimated to have approximately 138,768 acres of total lynx habitat, of which 129,417 (93%) were in occupied areas. The Gallatin portion was estimated to have a total of 833,002 acres of potential lynx habitat, of which 732,314 (88%) are in occupied areas. The 2017 amended incidental take statement (ITS) was based on occupied lynx habitat, resulting in anticipated acres of habitat exempted for treatment in WUI (6%) at 7,765 acres for the Custer, and 43,938 acres for the Gallatin. Combined, the two Forests were predicted to affect a maximum of 51,703 acres using the 6% exemption for fuel treatment in WUI.

Since the 2017 amended ITS was issued, the Forest re-mapped lynx habitat using updated data (as described in the BA, U.S. Forest Service 2020, p. 35-43), based on closer scrutiny of vegetation data for Forest plan revision, combined with updated information for projects based on site specific data collection and project implementation. The new mapping indicates the CGNF contains a total of approximately 846,606 acres of potential lynx habitat in occupied areas of the Custer Gallatin (combined) Forest, putting the 6% exemption figure at 50,796 acres for the combined CGNF.

Table II-3 shows all projects on the CGNF that have treated lynx habitat using WUI exemptions since 2007. All of the projects on the Gallatin were consulted on prior to the 2017 amended ITS; the two projects on the Custer were consulted on since 2017. These numbers reflect the most current amounts, based on the updated lynx habitat mapping. To date (since 2007), approximately 3,931 acres of snowshoe hare habitat have been treated using exemptions for fuel treatment in the WUI on the combined CGNF. These 3,931 acres represent 0.4 percent of all

lynx habitat in occupied areas of the Forest, well below the 6 percent exempted under the NRLMD. The Forest has also treated 40 acres using exceptions to the NRLMD for other resource benefit. Thus, to date the Forest has only treated a very small amount of lynx habitat using NRLMD exemptions or exceptions since the NRLMD was amended to the Forest Plans in 2007.

Table II-3. Projects on the Custer Gallatin National Forest using exemptions for fuel treatment in the WUI that have been implemented since the NRLMD amended the Forest Plans in 2007. Acres of habitat reflect the revised acres using revised mapping described in the BA.

Project Name	Acres Treated using Exemptions
East Boulder Fuel Reduction	392
Bozeman Municipal Watershed	1,080
Lonesome Wood II	1,678
Rendezvous Trails	8
North Hebgen	542
Greater Red Lodge*	133
Westfork HFRA*	98
Total	3,931

** NEPA and Section 7 consultation completed after submission of Forest Plan BA in 2020*

Fire Management

Wildfire has a strong influence on the age distribution and spatial arrangement of forest vegetation. Current management of wildland fire is guided by plans and policies at the Forest, regional, and national level, all of which are frequently evaluated and updated. Wildland fire has been present in the action area to an increasing extent since the mid-1980s, particularly in designated wilderness areas. 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 that burn are largely influenced by weather/climate, vegetation, and terrain. Recent, large, stand-replacing fires in lynx habitat on the Custer Gallatin occurred in 2012, with the Millie Fire in the MHG GA and the Pine Creek Fire in the AB GA, and in 2018 with the Bacon Rind Fire, which burned affected roughly 1,200 acres of lynx habitat.

Livestock Management

Currently, livestock grazing occurs in active grazing allotments on approximately 12 percent of the potential lynx habitat in occupied areas, and on just over 73 percent of the potential lynx habitat in unoccupied areas (BA, U.S. Forest Service 2020, p. 73). Livestock are present at lower densities in the montane ecosystem geographic areas where lynx habitat is present than in

the pine savanna geographic areas. Grazing operations follow the NRLMD guidelines (GRAZ G1, G2, G3, G4) in occupied lynx habitat and consider the NRLMD when managing grazing operations in unoccupied lynx habitat. Overall, grazing should be made compatible with improving or maintaining lynx habitat (GRAZ O1).

Human Use

Recreation Management

Developed recreation sites are sites or facilities with features that are intended to accommodate public use and recreation, such as campgrounds, rental cabins, fire lookouts, summer homes, and visitor centers. Recreation on the Forest 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 Forest is also influenced by numerous special area designations that define or limit types of activities occurring within them, including designated wilderness, wilderness study act areas (WSAs), recommended wilderness area (RWAs), inventoried roadless area (IRAs), eligible wild and scenic rivers, scenic byways, recreation areas, and others. Table 1 in the biological assessment errata display these designations in relation to lynx habitat (U.S. Forest Service 2021, p. 1). The NRLMD includes a number of objectives and guidelines intended to limit potential effects to lynx from various recreational activities (HU O1, O2, O3, O4; HU G1, G2, G3, G10, and G11).

Approximately 86 percent of occupied core potential lynx habitat is within congressionally designated wilderness, IRA, or RWA. Of the occupied secondary potential habitat, 63 percent is in a special designated area (BA, U.S. Forest Service 2020, p. 52). In addition to the limits associated with vegetation management described above, other human uses are constrained in these areas. Motorized and mechanized travel, including motorized over-snow travel, is restricted in designated wilderness and recommended wilderness. Recreation management in designated wilderness and recommended wilderness focuses on providing primitive experiences where the presence of humans is minimized.

There are two alpine (downhill) ski areas and three Nordic (cross-country) resorts that operate on the CGNF, all within potential lynx habitat; although one alpine area and one Nordic area are in unoccupied lynx areas. The effects to lynx from the two downhill ski areas, Red Lodge Mountain and Bridger Bowl, were previously consulted on (U.S. Fish and Wildlife Service 2001, 2003). Winter recreation activities are guided by the human use objectives and guidelines in the NRLMD.

Roads

The Forest has a network of authorized motorized and non-motorized roads and trails across the action area. National Forest System roads are categorized by their associated maintenance levels. Maintenance Level 5 corresponds with roads that are usually double lane, paved routes that accommodate a higher volume and higher speeds of traffic than most forest system roads. Maintenance Level 5 roads have the greatest potential for direct impacts on lynx, but account for a very small proportion (less than 1 percent) of roads within the national forest boundary. Over 90 percent of the National Forest System roads on the Custer Gallatin are Maintenance Level 2 or 3, which are generally narrow (often single track), gravel or other natural surface that accommodate low levels of slow-moving traffic. Of all the Forest System roads on the Custer Gallatin, less than half (about 47 percent) are open to the public. The remainder are for administrative use only (not open for public use). For more information on the existing conditions related to motorized access in the action area, see the grizzly bear chapter of this biological opinion.

Other non-Forest roads, including Interstate 90, and Montana Highways 191, 287, and 298, are major public travel corridors that separate portions of the Forest where these highways occur, potentially fragmenting the lynx habitat that occurs on the Forest. Other routes, like Montana Highways 89 and Interstate 90, and several highways between Red Lodge and the Pryor Mountains, occur between geographic areas at low elevations on mixed private and state lands and may contribute to the existing isolation of the island mountain ranges in the action area (see Appendix 3 of the BA for a map showing LAUs and major highways).

Snowmobile Use

Presently, over-the-snow motor vehicle use is allowed across numerous GAs within occupied and unoccupied lynx habitat. Over-the-snow motor vehicle use can be described by where it occurs on designated trails (miles of trails) and where it occurs in designated winter recreation areas that allow for off-trail use (acres). Within LAUs in occupied habitat, there are approximately 326 miles of over-the-snow motor vehicle use trails, with 244 of those miles being groomed. Within LAUs in unoccupied habitat, there are approximately 75 miles of over-the-snow motor vehicle use trails, with 60 of those miles being groomed. Where over-the-snow motor vehicle use can occur off-trail in winter recreation areas, this use generally does not occur within snowshoe hare habitat. It primarily occurs in open parks, sparse forests, and other areas that do not provide cover or forage for snowshoe hares.

Energy and Mineral Development

There are three types of mineral and energy resources utilized on the Custer Gallatin National Forest: locatable minerals including commodities such as gold, silver, copper, etc., saleable minerals such as sand, stone, and gravel, and leasable minerals such as oil, gas, and other natural commodities. Lands on the Forest 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. On the Custer Gallatin, more than 1 million acres (over a third of the National Forest System lands),

have been formally withdrawn from mineral entry, effectively prohibiting activities related to exploration, development and production of mineral resources. To date, some of the mineral withdrawals on the Custer Gallatin have occurred in the montane geographic areas, which is also where lynx habitat is located.

The majority of locatable mineral operations active on the Custer Gallatin in 2020 were located in the Stillwater complex in the AB GA. The Stillwater area has shown high potential for mineral development, specifically its unique platinum and palladium resources. The plan's Stillwater Complex is over 100,000 acres in size, of which about 45 percent is potential lynx habitat, and the remaining 55 percent of the area is non-lynx habitat. The AB GA, and hence the Stillwater Complex, are considered core, occupied lynx habitat. Lynx habitat in the Stillwater complex is roughly 11 percent of the potential lynx habitat in the entire AB GA, and about 5 percent of the potential lynx habitat in occupied lynx areas on the Forest.

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 law and regulations. Forest plans guide the specific manner in which the activities allowed by mineral leases or permits are carried out on the ground. Locatable mineral uses are managed through Plans of Operation and Notices of Intent that are developed at the time specific plans for minerals exploration or development are submitted to the Forest. The Forest can receive any number of Plans of Operation or Notices of Intent in a given year, each of which generally disturbs less than 1 acre. The actual number that are active in any given year changes and is generally dependent on the market price for the minerals of interest.

Minerals and energy development in occupied lynx habitat are subject to the NRLMD, including HU O5 and HU G4, G5, G6, G7, G8, G9, and G12. These components are considered when minerals or energy development is planned in unoccupied lynx habitat.

Climate Change

The lynx is a cold-climate and snow-adapted habitat and prey specialist. Thus, the species is vulnerable to climate warming, especially at the southern periphery of its range (U.S. Fish and Wildlife Service 2017a). Continued climate warming is expected to diminish boreal forest habitats and snow conditions at the southern edge of the range that are, in some places, already patchily-distributed and perhaps only marginally capable of supporting resident lynx (*Ibid.*).

Although projected climate warming is expected to reduce the future distribution and number of lynx, a substantial uncertainty about the timing, rate, magnitude, and extent of potential impacts that may affect lynx remains. Despite these uncertainties, specific effects of climate warming on lynx, snowshoe hares, and their habitats in the range of lynx can be reasonably anticipated include: (1) northward and upslope contraction of boreal spruce-fir forest types, (2) northward and upslope contraction of snow conditions believed to favor lynx over other terrestrial hare predators, (3) reduced hare populations and densities, and (4) changes in the frequency, pattern, and intensity of forest disturbance events. Other potential effects of projected warming include:

(5) reduced gene flow between Canadian and DPS lynx populations, (6) changes in the periodicity and amplitude of northern hare cycles, which could result in reduced lynx immigration to the DPS from Canada, and (7) increased or novel diseases and parasites.

Each of these factors is discussed in detail in the Species Status Assessment for the Canada lynx (*Ibid.*). Despite concerns about the long-term persistence of lynx, experts projected that resident lynx populations are very likely to persist in all 5 geographic units that currently support them in the near-term (year 2025) and mid-term (2050), and uncertainty was great regarding predictions beyond that time frame (*Ibid.*).

II.A.6. Effects of the Action

Under section 7(a)(2) of the Act, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 C.F.R. § 402.02). The effects discussed below are the result of implementing the CG Plan.

The CG Plan includes two standards that directly address lynx. Standard FW-STD-WLLX 01 states "The Northern Rockies Lynx Management Direction in appendix G [of the CG Plan] shall be applied." And Standard FW-STD-WLLX 02 states "to ensure that NRLMD exemptions for fuel treatment do not disproportionately affect designated critical habitat for lynx, vegetation management projects for fuel treatment in WUI that reduce snowshoe hare habitat, shall occur on no more than 6 percent cumulatively of the lynx habitat (excluding matrix) within designated lynx critical habitat on the Custer Gallatin National Forest."

The CG Plan carries forward the objectives, standards and guidelines in the Northern Rockies Lynx Management Record of Decision (appendix G of the CG Plan). The terms "standard" and "guideline" in the Northern Rockies Lynx Management Direction will be consistent with definitions of these terms found in Chapter 1 of the CG Plan. The definition of "objectives" in the Northern Rockies Lynx Management Direction will be applied consistent with the definition of "desired condition" in Chapter 1 of the CG Plan. The direction in the NRLMD will be applied to projects occurring in occupied lynx habitat and considered when management activities are planned in unoccupied lynx habitat. This biological opinion on the effects of the CG Plan on lynx supersedes our 2007 biological opinion and associated 2017 amended incidental take statement on the effects of the NRLMD on Canada lynx that are associated with the Forest.

Our effects analysis is based on what the CG Plan (and NRLMD) permits or prohibits, as well as a quantitative assessment of the effects to lynx from actions that have the most potential to negatively affect lynx. The analysis includes an estimate of acres that may be treated in snowshoe hare habitat under future actions that may affect lynx using the exemptions from and/or exceptions to the NRLMD that are incorporated into the CG Plan. While we analyze

what the CG Plan would allow, many activities that are allowed by the CG Plan direction are never fully carried out for a variety of reasons, such as funding limitations and environmental or policy considerations. However, the following sections analyze the potential effects to lynx from full implementation of activities that may occur under the direction in the CG Plan.

Vegetation Management

Vegetation management includes activities that change the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. For the purposes of this analysis, vegetation management 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 wildland fire use. Vegetation management can have beneficial, neutral, or adverse effects on lynx and snowshoe hare habitat. Negative impacts to individual lynx could occur through management actions that remove, change, or reduce the amount or density of horizontal cover in boreal forest types that are naturally capable of supporting snowshoe hares. Vegetation management in areas that have no potential to support snowshoe hares, or actions designed to maintain a stand's existing condition, would be neutral to lynx. Finally, vegetation management can benefit lynx habitat in mature forest types where understory cover is lacking.

As described in the biological assessment (U.S. Forest Service 2020a, p. 63), the total amount of NFS lands in the suitable timber base will decline in the CG Plan, and the amount of potential lynx habitat types that are suitable for timber production would decrease under the revised plan as well. Currently 14 percent and 33 percent of occupied and unoccupied lynx habitat is classified as suitable for timber production. Those amounts drop to 12 percent and 23 percent under the CG Plan (Ibid. at p. 56). The NRLMD components in the CG Plan components will be applied to timber production and timber harvest activities in occupied lynx habitat and will be considered in unoccupied lynx habitat.

The NRLMD has identified four objectives related to vegetation management that would improve the quality of lynx habitat by improving conditions for prey: (1) manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx (Objective VEG O1); (2) provide a mosaic of habitat conditions through time that support dense horizontal cover and high densities of snowshoe hare, and provide winter snowshoe hare habitat in both the stand initiation structural stage and in the mature, multi-story conifer vegetation (Objective VEG O2); (3) conduct fire use activities to restore ecological processes and maintain or improve lynx habitat (Objective VEG O3); and (4) focus vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover (Objective VEG O4).

Forest management activities can result in a conversion of vegetation types. For example, silvicultural prescriptions might be designed to change species composition to favor ponderosa pine, which has a high economic value, at the expense of lodgepole pine, which has low economic value but provides better lynx habitat. This kind of stand type conversion could

negatively affect lynx habitat. The Objectives VEG O1, O2, O3, and O4 reduce the potential for adverse effects to lynx from such conversions of habitat. Attainment of the vegetation management objectives through projects designed using vegetation management standards and guidelines would support lynx survival and conservation. With the application of these measures, we do not anticipate that the proposed action would adversely affect lynx via habitat conversions within the action area.

The primary factors driving lynx populations, behavior, and distribution are the abundance and distribution of snowshoe hares. Vegetation management activities can result in a setback of vegetation succession to an early stand initiation structural stage, which may be used by snowshoe hares during the summer but is snow-covered and thus unavailable to hares during the winter. Eventually these stands may regenerate into a stand initiation structural stage, providing high stem densities and horizontal structure extending above the snowpack during winter, and become high quality snowshoe hare habitat (Squires et al. 2010, Kosterman 2014, Holbrook et al. 2017, Holbrook et al. 2018). Older forested stands also provide high quality habitat when they provide multi-story mature or late successional forests that provide high horizontal cover for both lynx and snowshoe hare (Murray et al. 1994, Squires et al. 2010, Kosterman 2014, Holbrook et al. 2017, Kosterman et al. 2018, Holbrook et al. 2019). In Montana, these stands within a study area were used consistently by both lynx and snowshoe hare during the winter (Squires et al. 2010). These stands, along with stands in a stand initiation structural stage (including early stand initiation), provide the landscape mosaic of habitat conditions needed for snowshoe hare production and lynx foraging habitat (Kosterman 2014, Kosterman et al. 2018).

Standards VEG S1, VEG S2, VEG S5, and VEG S6 would lead to attainment of the vegetation objectives described above by limiting the disturbance to snowshoe hare habitat and ensuring that enough habitat within each LAU would be available to provide lynx with sufficient snowshoe hare prey and lynx foraging habitat conditions. Under Standard VEG S1, if more than 30 percent of lynx habitat in an LAU is in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects. Additionally, Standard VEG S2 requires that timber management projects shall not regenerate (i.e., change to stand initiation structural stage) more than 15 percent of lynx habitat within an LAU in a 10-year period. While some treatment may result in regenerating lynx habitat to stand initiation structural stages, these young stands typically contain high stem densities and horizontal cover, which provides summer habitat and eventually grows into essential winter foraging habitat for snowshoe hares. Vegetation Standards VEG S1 and VEG S2 promote a balance, a mosaic, of young and older stands within each LAU.

Thinning stand initiation structural stages can reduce horizontal cover that is critical to maintain the snowshoe hare prey base. High horizontal cover is important to hares and lynx. Reducing dense horizontal structure through silvicultural thinning would likely reduce an area's carrying capacity for snowshoe hares (Ruggiero et al. 2000; Griffin and Mills 2004, 2007; Homyack et al 2007; Interagency Lynx Biology Team 2013). By deferring precommercial thinning activities that reduce snowshoe hare habitat until the stand no longer provides winter snowshoe hare habitat, Standard VEG S5 ensures that stand initiation snowshoe hare and lynx habitat is not

degraded. This standard protects and maintains the high stem densities that provide high quality snowshoe hare forage during summer and/or winter seasons and maintains the inherent capacity of the habitat to produce snowshoe hares.

As previously mentioned, lynx preferentially forage in spruce-fir forests with high horizontal cover, abundant hares, deep snow, and large-diameter trees during the winter. The high horizontal cover found in multi-story conifer stands is a major factor affecting winter hare densities. During winter, snowshoe hares were consistently found in multi-story forest stands (Squires et al. 2010). These older, multi-story stands provide forage, hiding cover, and likely thermal cover for both snowshoe hares and lynx. Standard VEG S6 precludes vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late successional forests. This standard protects mature, multi-story habitat that provides a dense understory and high quality snowshoe hare habitat and also maintains the inherent capacity of the habitat to produce snowshoe hares.

Guideline VEG G1 directs that vegetation management projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority for treatment should be given to stem-exclusion, closed-canopy structural stage stands to enhance habitat conditions for lynx or their prey. In other words, emphasis should be on those stands that do not currently provide snowshoe hare habitat, which in turn may improve snowshoe hare habitat over the long-term. Adverse effects to lynx are not anticipated as a result of treatments in a stem exclusion or similar stage. Such stands are characterized as having a closed canopy with limited understory, lacking dense cover preferred by hares and are generally not progressing towards year-round snowshoe hare habitat. Treatment of stem exclusion stands would open up the stands and encourage an increase in horizontal cover (understory regeneration). Thus, treatments in these stands do not reduce existing snowshoe hare habitat and have the potential to improve the habitat for snowshoe hares by either creating openings to allow understory growth or stimulating the regeneration of dense stands of young trees used by hares.

Guideline VEG G5 is focused on habitat for alternate prey species, primarily red squirrel and directs that such habitat should be provided in each LAU. Red squirrel habitat typically contains snags and downed wood, generally associated with mature or older forests, which may be used by lynx for denning if the required components are provided and it is in close proximity to snowshoe hare habitat. Guideline VEG G11 directs that denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees (“jack-strawed” piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles, or residual trees to provide denning habitat in the future. Denning habitat elements are generally found distributed across the action area. Vegetation management projects may result in localized effects to denning habitat by removing existing coarse woody material and/or affecting its recruitment. This can affect the quality and quantity of available lynx denning habitat. In most cases, denning habitat is not known to be limited within lynx habitat in the action area, and the vegetation management objectives, standards, and guidelines either directly or indirectly promote the development and retention of adequate amounts of denning habitat. In

the cases where denning habitat may be affected by vegetation management, Guidelines VEG G5 and VEG G11 would minimize the potential for effects by requiring that such habitat be provided and well distributed. Therefore, vegetation management is unlikely to result in adverse effects to denning habitat.

Vegetation management activities proposed under the CG Plan may result in some level of disturbance effects to lynx if lynx are in the project area during project implementation. Such disturbance is expected to be insignificant as areas free of disturbance are typically available if a lynx needed to adjust movement patterns during implementation. While vegetation treatments could alter structural stages of potential lynx habitat, they are not likely to result in the construction of any barriers known to inhibit lynx movements. The vegetation management standards and guidelines work together to promote the vegetation management objectives. In addition to the vegetation management standards, standard ALL S1 also applies to vegetation management projects in that vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area. Having this standard apply to each LAU (which represents a lynx home range) would maintain connectivity among LAUs and throughout the larger landscape, thus minimizing the potential impacts to habitat connectivity and linkage areas from vegetation management. Site-specific projects are not likely to impede lynx movement or reduce habitat connectivity. We do not expect habitat connectivity or linkage to be adversely affected from vegetation management projects conducted under the CG Plan. Treatments proposed under the CG Plan are not expected to preclude any future use of an area by a resident lynx (if present) or a transient lynx should they pass through the area.

Based on the best available information, the Service concludes that the NRLMD (CG Plan) would conserve the most important components of lynx habitat: a mosaic of early and mature multi-story forests with high levels of horizontal cover and structure. These components ensure habitat that maintains its inherent capability to support both snowshoe hare prey base and adequate lynx foraging habitat (snowshoe hare habitat) and denning habitat. These standards and guidelines are applicable to all vegetation management actions on at least 94 percent of occupied lynx habitat within the action area. As analyzed below, areas within the WUI as well as some resource benefit activities (totaling approximately 6 percent of occupied lynx habitat) may occur under the exemptions from and exceptions to from the standards. However, Guideline VEG G10 would apply and requires consideration of the standards in designing fuel treatment projects. Where these standards and guidelines are applied to vegetation management projects, we anticipate few projects, if any, would have adverse effects on lynx.

Exemptions from and exceptions to vegetation management standards for fuel treatment projects in the WUI and activities for other resource benefit

The NRLMD includes exemptions from Standards VEG S1, VEG S2, VEG S5, and VEG S6 to allow for fuel treatment projects within the WUI. In addition, exceptions listed in VEG S5 and VEG S6 would allow some activities for other resource benefit such as to protect structures, for research, and/or to promote the conservation of tree species such as whitebark pine and aspen. These exemptions and exceptions would allow actions that may have adverse effects on lynx in

occupied lynx habitat by reducing the horizontal structure of natural forest succession phases, and/or affecting the mosaics of the forested landscape in localized areas (i.e. affecting snowshoe hare habitat). For the same reasons as explained above, we do not expect adverse effects to other lynx habitat features, such as denning habitat or stem exclusion habitat, from vegetation management using the exemptions and/or exceptions.

Under the CG Plan, the Forest has estimated that invoking NRLMD exemptions to VEG S1, S2, S5 and S6 in occupied lynx habitat could result in a maximum of 46,865 acres of snowshoe hare habitat treated over the life of the plan. This number is based on the current best estimates that indicate a total of approximately 846,606 acres of potential lynx habitat in occupied areas of the Custer Gallatin (combined) Forest, putting the 6 percent exemption figure at 50,796 acres for the combined CGNF. The Forest has treated 3,931 acres to date (see above), leaving 46,865 acres that may still be treated using exemptions to the NRLMD in occupied habitat. Thus the total maximum amount of snowshoe hare habitat within occupied lynx habitat that could be treated under the CG Plan using exemptions or exceptions to NRLMD standards is 49,125 acres or about 6 percent of occupied lynx habitat in the action area.

Objectives for the CG Plan call for a minimum of 6,000 acres of hazardous fuels treatment per year over the life of the plan (FW-OBJ-FIRE 01). Not all fuel reduction projects would occur in lynx habitat, and not all of those that could occur in lynx habitat would require use of the exemptions for treating snowshoe hare habitat. Based on revised plan objectives, it is reasonable to assume that fuel treatment projects in lynx habitat using the NRLMD exemptions would be accelerated relative to projects implemented under existing plans. However, such projects would not exceed the remaining 46,865 acres of snowshoe hare habitat treatment allowed in the total exemptions provided in the NRLMD over the life of the plan (U.S. Forest Service 2020, p. 58 and email communication from J. Hemenway, September 27, 2021).

Table II-4. Acres of snowshoe hare habitat that may be treated in occupied lynx habitat under the CG Plan using the exemptions from and/or exceptions to the NRLMD vegetation standards (adapted from U.S. Forest Service 2020).

Lynx Habitat	Acres
Potential Lynx Habitat on the Forest	846,606
Potential Lynx Habitat in WUI	240,201
Maximum Snowshoe Hare Habitat That May Be Treated Using Exemptions for Fuel Treatment Projects in the WUI	46,865
Maximum Snowshoe Hare Habitat That May Be Treated Using Exceptions for Activities for Other Resource Benefits	2,260
Total Snowshoe Hare Habitat That May Be Treated Using Exemptions and/or Exceptions	49,125
Percent of Occupied Potential Lynx Habitat That May Be Treated using Exemptions an/or Exceptions	5.8 %

**In unoccupied lynx habitat application of the NRLMD is not required and vegetation treatments need only to consider the NRLMD.*

The Forest has treated a total of 3,971 acres of lynx habitat in occupied areas of the Forest since 2007 (3,931 acres using exemptions and 40 acres using exceptions; Table II-3). Based on the amount of snowshoe hare habitat treated over the past 14 years, it is highly unlikely that all of these acres of snowshoe hare habitat that could be treated under the exemptions from and exceptions to the vegetation management standards would actually be treated. However, because future activities are unknown, the maximum amount of snowshoe hare habitat that could be treated over the life of the CG Plan, and in turn may adversely affect lynx, is analyzed here.

It is important to note that mapped lynx habitat consists of a mosaic of various forest structural stages and not all mapped lynx habitat is providing snowshoe hare habitat at the same time. However, at a programmatic scale such as the CG Plan, it is not possible to accurately map snowshoe hare habitat at every point in time for the life of the plan. Forest structural stages change over time and what is providing snowshoe hare habitat today may not be at some point in the future and what is not providing snowshoe hare habitat today may provide such in the future. In addition, treated areas have the potential to provide snowshoe hare habitat again, over time. Thus, we are analyzing the maximum amount that could be treated to be sure we do not overlook any potential effect. While the amounts provided in Table II-4 display the maximum amounts of snowshoe hare habitat that could be treated, it is not expected that this maximum would be reached all at the same time and will likely never be reached.

The CG Plan is a framework programmatic action and does not authorize, fund, or carry out an action but provides direction for future actions that may be authorized, funded, or carried out by the Forest. Since no site-specific projects are planned at this time, it is difficult to predict what may be proposed and what effects such projects may have. Therefore, any action subsequently authorized, funded, or carried out under the CG Plan will be addressed in subsequent section 7 consultations, as appropriate. Future site-specific consultations on projects will provide both the amount of snowshoe hare habitat within the action area LAU(s) and the amount of snowshoe hare habitat affected by the action, thus, analyzing the specific amount of snowshoe hare habitat that will be affected. Based on the history of vegetation management on the Forest, we expect that such an analysis will likely reveal that much of the treatments will not occur within snowshoe hare habitat.

For perspective on the total amount of snowshoe hare habitat that may be treated with projects that may adversely affect lynx, the average home range size of a lynx was reported as 53,375 acres for males and 21,745 acres for females (Squires et al. 2004). Acres treated are expected to be distributed throughout the Forest, over 21 occupied LAUs and 4 unoccupied LAUs, and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs. Thus, adverse effects, while possible, are likely to affect only portions of any individual lynx home range. Further, many of the WUI areas occur at lower elevation (i.e. near the lower edge of lynx habitat) and are less likely to be the highest quality lynx habitat, which may reduce the potential

overall effect of the exemptions and exceptions. Under the NRLMD, vegetation management that adversely affects lynx would not be allowed in the majority of lynx habitat.

The exemption from Standard VEG S1 for fuel treatment projects within the WUI would affect the forest mosaic by allowing more than 30 percent of lynx habitat within an LAU to be in a stand initiation structural stage not yet providing winter snowshoe hare habitat. The exemption for fuel treatment projects in the WUI in Standard VEG S2 would allow more than 15 percent of an LAU to be regenerated to a stand initiation structural stage within a decade. Where exemptions from Standards VEG S1 or VEG S2 are used within the WUI, adverse effects to lynx may occur by temporarily reducing the quality and productivity of lynx foraging habitat until treated stands begin to provide snowshoe hare habitat.

The exemption from Standard VEG S5 for fuel treatment projects in the WUI would reduce natural levels of horizontal structure in early successional phases by allowing precommercial thinning during the stand initiation structural stage, prior to when the stand no longer provides winter snowshoe hare habitat. It is well documented that such thinning in hare habitat results in a corresponding decrease in the abundance of snowshoe hares (see Ruggiero et al. 2000). Thinning dense stands of young trees may adversely affect lynx by reducing the capacity of these stands to produce snowshoe hares. Similarly, the exemption for fuel treatment projects in the WUI from Standard VEG S6 would likewise allow management actions that would reduce the horizontal cover and thus the quantity and quality of snowshoe hare habitat in older, multi-story stands, potentially resulting in adverse effects to lynx. Research has documented the importance of these multi-story stands as foraging habitat for lynx and for hares (Squires et al. 2010), especially during the winter months. Thus, exemptions in either Standard VEG S5 or VEG S6 may reduce the capacity of an LAU to support lynx reproduction and/or occupancy. Overall, the NRLMD limits the exemptions from Standards VEG S5 and VEG S6 to areas within the WUI and the anticipated adverse effects would occur on no more than 46,865 acres of snowshoe hare habitat within occupied lynx habitat. The site-specific impact would depend upon the size of the treated area as well as the inherent capacity of the site to produce snowshoe hares and may not always result in adverse effects. In addition, in most cases, these reductions are temporary as vegetation typically grows back and would likely provide snowshoe hare habitat again, over time.

While exemptions are in place for fuel treatment projects in the WUI, Guideline VEG G10 directs that such projects should be designed considering Standards VEG S1, VEG S2, VEG S5, and VEG S6 to promote conservation. Thus, while some adverse effects to lynx may occur by use of the exemptions, consideration of the standards in designing fuel treatment projects may result in minimizing such effects.

The NRLMD also allows exceptions to Standards VEG S5 and VEG S6 for activities that would protect structures from wildfire, for research, to conserve other vegetation communities such as whitebark pine and aspen, and/or for incidental removal during salvage harvest. Such treatment could reduce the quantity and/or quality of snowshoe hare habitat by reducing the horizontal cover, potentially affecting the ability of an LAU to support lynx reproduction and/or occupancy.

The maximum amount of treatment allowed in occupied lynx habitat on the Forest under the exceptions to the Standards VEG S5 and VEG S6 is 2,300 acres. However, the site-specific impact would depend upon the size of the treated area as well as the inherent capacity of the site to produce snowshoe hares and may not always result in adverse effects. Vegetation management projects utilizing exceptions to NRLMD VEG S5 and VEG S6 for other resource benefits in occupied lynx habitat are anticipated to be small scale, and estimated to affect a total of only 2,300 acres of lynx habitat across the entire Forest. To date, only 40 acres of lynx habitat have been treated under these conditions on the Custer Gallatin, leave 2,260 acres that could be treated under the CG Plan.

While the Forest must apply the NRLMD in occupied lynx habitat, they only need to consider applying the NRLMD in unoccupied habitat. Potential lynx habitat exists in unoccupied areas as well, and it is likely that vegetation management implemented under the revised plan will affect potential lynx habitat in these areas. The most current mapping efforts predict a total of 137,084 acres of potential lynx habitat in unoccupied areas on the Custer Gallatin National Forest. To date, only 119 acres of potential lynx habitat has been affected by vegetation management in unoccupied areas. This treatment met all NRLMD provisions that apply in occupied lynx habitat. The NRLMD states that projects in unoccupied lynx habitat should consider the goals, objectives, standards and guidelines that apply in occupied lynx habitat. Assuming that consideration of NRLMD components results in similar management of lynx habitat in unoccupied areas, then 6 percent of lynx habitat is a reasonable estimate for future effects of vegetation management projects in unoccupied habitat as well. This assumption results in approximately 8,100 acres of potential future projects that could reduce snowshoe hare habitat in unoccupied areas, or that would fall under the NRLMD exemptions or exceptions, should the currently unoccupied areas become occupied by lynx. Treatment of snowshoe hare habitat may not be limited to the acres treated using the exemptions from and/or exceptions to the vegetation standards of the NRLMD. Since unoccupied areas are expected to receive only transitory use by lynx, temporary reductions in snowshoe hare habitat are expected to have insignificant effects for lynx moving through these areas.

The portions of the action area that are within unoccupied lynx habitat are located within secondary Canada lynx habitat or a 'secondary area' as defined in the Canada Lynx Recovery Outline (U.S. Fish and Wildlife Service 2005) and Revised LCAS (Interagency Lynx Biology Team 2013). The revised LCAS indicates that secondary areas might contribute to lynx persistence by supporting successful dispersal or exploratory movements. Habitat in these areas appears to be inherently patchier and less productive and likely only supports lynx intermittently. The LCAS further speculates that "the amount and quality of habitat required to support an independent adult or subadult disperser is less than is necessary to support reproduction and sustain a local population" (*Ibid*). It also indicates that the focus of management in secondary areas is on "providing a mosaic of forest structure to support snowshoe hare prey resources for individual lynx that infrequently may move through or reside temporarily in the area" and that landscape connectivity should be maintained to allow for movement and dispersal.

While unoccupied lynx habitat and more specifically snowshoe hare habitat within unoccupied lynx habitat may be affected by a variety of activities proposed under the CG Plan, these activities are expected to result in insignificant effects. Based on the types of activities that would typically be proposed under the CG Plan, any effects to snowshoe hare habitat within unoccupied lynx habitat are expected to range from no effects to minimal effects. As such, implementation of projects allowed by the CG Plan are not likely to impede lynx movement and are not likely to reduce habitat connectivity. If transient lynx were to be in a future project area within unoccupied lynx habitat during implementation, the potential for disturbance is expected to be short-term and is not expected to result in significant effects or reduce an individual's ability to move through the area. Management actions are not expected to preclude any future use of unoccupied lynx habitat by lynx. Consequently, effects to lynx in unoccupied lynx habitat from vegetation management actions would likely be insignificant.

Of note, since 2007, the Forest has not only considered the NRLMD in unoccupied lynx habitat but has applied the NRLMD components to all vegetation management projects in unoccupied lynx habitat. While the effects analysis does not rely on the fact that the NRLMD will be met within unoccupied lynx habitat, it is not unreasonable to expect that the applicable standards and guidelines in the NRLMD will be met for future projects within unoccupied lynx habitat.

In summary, vegetation management under the NRLMD would promote forested landscape patterns that maintain or restore lynx habitat. This positive effect would occur for the most part throughout lynx habitat in the action area with the exception of treatments within snowshoe hare habitat associated with vegetation management exemptions and/or exceptions. Actions implemented under the exemptions from and/or exceptions to the vegetation standards of the NRLMD may adversely affect lynx. Adverse effects to lynx as a result of these exemptions and exceptions may occur specifically due to the treatment of snowshoe hare habitat. This includes treating up to 49,125 acres of snowshoe hare habitat in occupied lynx habitat. Snowshoe hare habitat could be diminished primarily through the removal of the dense horizontal structure of natural forest succession phases and/or altering the mosaics of the forested landscape in localized areas.

Effects to lynx as a result of vegetation management in unoccupied lynx habitat or secondary areas will likely be minimal and would not significantly affect how lynx would use the habitat because quality lynx habitat is lacking on these portions of the action area. Unoccupied lynx habitat on the Forest is expected to continue to provide a mosaic of forest structure to support snowshoe hare prey resources for individual lynx that infrequently may move through or reside temporarily in these areas and landscape connectivity on the Forest would be maintained to allow for movement and dispersal.

Although the exemptions from and exceptions to vegetation management standards may result in some level of adverse effects to lynx, vegetation objectives, standards, and guidelines overall would contribute to creating and maintaining landscape patterns that sustain snowshoe hare and lynx populations. No permanent loss (such as paving or building construction) of habitat or conversion of the boreal forest would occur as a result of vegetation management under the

NRLMD. Some vegetative treatments may degrade the function of lynx habitat by delaying the development of high density snowshoe hare habitat through succession; however, they do not remove such habitat from the site. The habitat would retain its inherent capacity to regenerate and while such actions may change the successional stage of a stand, they do not affect that stand's potential to produce snowshoe hare habitat in the future. Although vegetation management under the NRLMD may adversely affect individual lynx, any affected LAUs are expected to remain capable of producing snowshoe hares to support lynx presence.

Fire Management

The CG 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. Under the CG Plan, naturally occurring fire would continue to be a primary driver of ecosystem processes on much of the Forest.

Wildfire may result in the reduction of snowshoe hare habitat, temporarily reducing an area's ability to provide lynx foraging habitat. Conversely, wildfire can regenerate habitat that currently does not provide snowshoe hare habitat to an early stand initiation structural stage, which may then move towards providing year-round snowshoe hare habitat. Outside of the wildland urban interface, direction adopted from the NRLMD would encourage prescribed fire use (Objective VEG O3) to improve lynx habitat over time by strategically placing fire on the landscape in lynx habitat currently lacking high horizontal cover, as fire often promotes recruitment of a high density of conifers, hardwoods and shrubs needed to support snowshoe hares.

In certain areas, however, wildfire would be managed to protect resources at risk. Wildfire suppression has the potential to alter vegetation mosaics and species composition that may reduce the quality and/or quantity of lynx habitat. In western forests, fire exclusion in areas with a history of infrequent fire return intervals has probably not had much impact. But areas where the fire regime was historically frequent or mixed has generally shifted to more intense fire regimes, resulting in forest compositions and structures that are more homogeneous, composed of more shade-tolerant species with more canopy layers, and are more susceptible to severe fires, insects, and diseases. The effects associated with wildfire decisions such as suppression activities will be analyzed during site-specific emergency consultation procedures as applicable.

Livestock Management

Livestock management includes grazing of livestock on Forest lands. Livestock may compete with snowshoe hares for forage resources (Ruediger et al. 2000). Browsing or grazing also could impact plant communities that connect patches of lynx habitat within a home range. Effects to snowshoe hare habitat such as riparian willow and aspen communities as a result of livestock grazing are most likely to affect lynx (Interagency Lynx Biology Team 2013). Conversely, appropriate grazing management can rejuvenate and increase forage and browse in some

habitats. At the time of the lynx listing, the Service found no evidence that grazing was a factor threatening lynx, therefore, grazing was not addressed in the final lynx listing rule (March 24, 2000; 65 FR 16052). Overall, grazing is not likely to reduce the snowshoe hare prey base or have substantial effects on lynx (Interagency Lynx Biology Team 2013). As such, there is no existing research that provides evidence of lynx being adversely affected by grazing, or of lynx movements within home ranges being impeded by grazing practices.

The CG Plan includes desired conditions for livestock grazing allotments to maintain or trend toward desired ecological conditions stated for a variety of habitats (FW-DC-GRAZ 01), which include boreal forest types that could support lynx (NRLMD Objective GRAZ O1), as well as important intervening types that provide connectivity between patches of lynx habitat. To this end, the revised plan would require new or revised allotment management plans to incorporate grazing practices that avoid, minimize or mitigate adverse impacts to ecosystems (FW-STD-GRAZ 01, FW-GDL-GRAZ 03, 07, 08).

The CG Plan also contains a number of plan components to manage livestock impacts in riparian habitats and deciduous woodlands such as aspen stands (FW-GDL-GRAZ 01, 02, 04, 05). These forest-wide plan components are complementary to direction adopted from the NRLMD guidelines (GRAZ G2, G3 and G4), which collectively, would serve to minimize livestock impacts in areas that function as important secondary habitat for lynx, and help maintain connectivity between patches of primary (boreal forest) habitat.

The quality and quantity of snowshoe hare habitat would not be significantly diminished as a result of grazing livestock. Effects to lynx denning habitat would likely be none to very negligible. Disturbance associated with human activity related to livestock grazing would likely be minimal. Livestock grazing is not expected to create a barrier or impede lynx movement within a potential home range. With the application of the NRLMD guidelines, the effects of grazing across the action area would be minimal and livestock management under the CG Plan is expected to either have no effects to lynx or have insignificant and/or discountable effects to lynx depending on site-specific information.

Human Use Projects

Human use projects include actions such as recreation management, Forest roads, and mineral and energy development. Recreation management includes developed ski areas, winter dispersed recreation, and non-winter dispersed recreation. Below we analyze the effects to lynx in general.

Recreation Management

Recreation settings are categorized into five recreation opportunity spectrum (ROS) classes ranging from primitive (e.g., designated wilderness) to rural (such as areas immediately adjacent to small communities or private land inholdings, and others). The CG Plan designates or identifies specific areas in which management would emphasize recreation values, and recreation

emphasis areas run the gamut for ROS from semi-primitive non-motorized in the upper section of the Hyalite REA, to semi-primitive motorized and roaded natural for most REAs. Linear REAs associated with road/river corridors (Gallatin Canyon, Yellowstone, Boulder and Rock Creek) are rural along paved sections of road, and roaded natural along unpaved portions. The revised plan includes separate plan components for each category of ROS (FW-DC/STD/GDL-ROS), which is also consistent and highly correlated with the land use designations and allocations. For example, no new motorized routes would be allowed in primitive ROS.

Management or development of recreation sites or facilities would occur in compliance with recreation settings. Through incorporation of the Northern Rockies Lynx Management Direction, and additional plan allocations that restrict access and certain types of use outside of recreation emphasis areas, the revised plan provides tools for managing high use areas and effectively consolidating such use, which would be consistent with the intent of the Northern Rockies Lynx Management Direction for conserving lynx habitat.

The main effect of non-winter recreation is potential disturbance to lynx rather than effects to habitat. While studies that have considered the reactions of lynx to human presence are few, anecdotal information does suggest that lynx are rather tolerant of humans (Interagency Lynx Biology Team 2013). Due to the low susceptibility of lynx to displacement by humans, non-winter recreation presents low risk of effects to how lynx use the action area. Effects to lynx from non-winter dispersed recreation are not likely to be adverse.

Dispersed winter recreational uses and activities, such as snowmobiling, cross-country skiing, and snowshoeing also occur and are expected to continue to occur within the action area. The range of lynx is restricted to forested areas with deep snow conditions during the winter. Lynx evolved in and are highly adapted to a boreal forest environment. Morphologically, lynx are well-adapted to hunting snowshoe hares in deep snow (Murray and Boutin 1991) in densely forested environments. Lynx have very large feet in relation to body mass, which prevents them from sinking deep into snow. This provides lynx with an inherent competitive advantage over many other mammalian carnivores in deep snow conditions. Their primary prey, snowshoe hare are also adapted to living in dense boreal forests in areas with abundant snow. Within the last century, coyotes have expanded their range from western and central prairie regions in North America to forests of the east and far north. Morphologically, coyotes are at a disadvantage hunting in high snow areas, as their feet are fairly small in relation to body mass and they therefore sink into soft snow (Murray and Boutin 1991).

To date, research has confirmed that lynx and coyote populations coexist, despite dietary overlap and competition for snowshoe hare 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 from near the action area (an area populated by both lynx and coyotes) concludes that coyotes did not require compacted snow routes to access winter snowshoe hare habitat (Kolbe et al 2007, Interagency Lynx Biology Team 2013). In our final rule (March 24, 2000; 65 FR 16052), snow compaction created by human activities was not found to be a threat to the lynx DPS. We also

have no evidence that packed snow trails facilitated competition to a level that negatively affects lynx or lynx populations.

The CG Plan includes NRLMD Objective HU O1 to maintain the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat. In addition, recreation activities should be managed to maintain lynx habitat and connectivity (Objective HU O2) and rather than developing new areas in lynx habitat, activities should be concentrated in existing developed areas (Objective HU O3). The NRLMD Guideline HU G11 states that designated over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction, unless designation serves to consolidate use and improve lynx habitat. Further, Guideline HU G12 limits winter access for non-recreation special uses and mineral and energy exploration and development to designated routes or designated over-the-snow routes.

Under the CG Plan, there would be an overall decrease in acreage suitable for motorized over-the-snow recreation at the scale of the Forest compared with the existing condition. A total of 12,373 acres (7,069 unoccupied habitat and 5,304 occupied habitat) associated with designated Recommend Wilderness Areas would no longer be suitable for motorized over-the-snow opportunities.

The CG Plan identifies two winter recreation emphasis areas (REAs): Hebgen and Cooke City. These areas combined cover about 95,000 acres, of which approximately 51 percent is potential lynx habitat. The areas have been popular winter recreation areas with groomed snowmobile and ski runs for years. Winter recreation in these REAs may impact lynx as described above, but emphasis areas can serve to consolidate such use, thereby potentially limiting impacts from dispersed winter recreation in surrounding lynx habitat. Both of these areas are adjacent to other areas in which winter recreation is more limited (U.S. Forest Service 2020, p. 69). In total, just 6 percent of occupied lynx habitat on the Forest falls within a winter REA (BA Errata, U.S. Forest Service 2021, p. 2).

The Northern Rockies Lynx Management Direction contains guidelines that limit expansion of winter use areas and designated over-snow routes (NRLMD Guidelines HU G2, G3 and G11) that would limit impacts to lynx within the winter REAs. Through incorporation of the Northern Rockies Lynx Management Direction, and additional plan allocations that restrict access and certain types of use outside of recreation emphasis areas, the CG Plan provides tools for managing high use areas and effectively consolidating such use, which would be consistent with the intent of the Northern Rockies Lynx Management Direction for conserving lynx habitat.

A study of lynx in and around high use winter recreation areas in Colorado revealed that lynx reduced their rate of movement and became more nocturnal in areas with high levels of backcountry skiing and snowmobiling (Olson et al. 2018). Lynx in this study tended to avoid areas of intense motorized use, but used areas in close proximity to non-motorized trails. Highly developed ski resorts in Colorado were avoided by lynx, particularly during peak human use times. This study concluded that lynx did not show strong negative responses to dispersed

recreation, but altered behavior patterns, indicating potential avoidance of recreationists. Lynx avoidance of developed recreation sites with high intensity of human use suggests there is some level of human disturbance that is not tolerated by lynx. Thus, winter dispersed recreation such as snowmobiling, cross-country skiing, or snowshoeing may indirectly result in insignificant effects via disturbance and/or snow compaction. Disturbance effects would be temporary, short-term, and spread out over space and time. While snow compaction may occur, the areas of compaction are localized. Thus, adverse effects from winter dispersed recreation are not anticipated.

Developed recreation can result in the direct loss of lynx habitat, and depending on the structural stage, could affect snowshoe hare habitat or lynx denning habitat. Developments such as ski areas can result in permanent loss of lynx habitat through the development of permanently groomed runs and resort infrastructure, such as lift termini, buildings and roads. Some loss of lynx habitat may be unavoidable with development, but at the scale of the Forest, relatively small areas are affected. There are two alpine (downhill) ski areas and three Nordic (cross-country) resorts that operate on the CGNF, all within potential lynx habitat; although one alpine area and one Nordic area are in unoccupied lynx areas. Red Lodge Mountain Ski Area is located in occupied lynx habitat and was previously consulted on in a 2001 programmatic biological opinion on ski resorts in Montana (U.S. Fish and Wildlife Service 2001). While individual lynx may be affected, the Service determined that operations of ski areas within Montana would not jeopardize the lynx population.

The effects of any future expansions related to the Red Lodge Ski Area would be analyzed site-specifically and site-specific consultation would occur, as applicable. The Bridger Bowl Ski Area is located in unoccupied, secondary lynx habitat and is not likely to significantly affect transient lynx that may occasionally use the area. The ski area is not likely to negatively affect connectivity with occupied lynx habitat as it does not create a barrier or impede lynx movement.

The NRLMD includes objectives, standards, and guidelines that address the most serious consequence of development, requiring new or expanding permanent developments to maintain or where possible, promote habitat connectivity within LAUs and linkage areas (Objective All O1, Standard All S1, Guideline All G1, Objective LINK O1, and Standard LINK S1). Recreational activities should be managed to maintain lynx habitat and connectivity (Objective HU O1), with activities concentrated in existing developed areas, rather than developing new areas in lynx habitat (Objective HU O3). Objective HU O4 provides for lynx habitat needs and connectivity when developing new or expanding existing developed recreation sites or ski areas.

Several guidelines in the NRLMD reduce impacts within the development itself, including: adequately sized inter-trail islands that support winter snowshoe hare habitat (Guideline HU G1), providing foraging habitat for lynx that is consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes (Guideline HU G2), provide for lynx movement and maintain the effectiveness of lynx habitat (Guideline HU G3), and consider the location of access roads and lift termini to maintain and provide lynx security habitat if identified as a need (Guideline HU G10).

Some use of lynx habitat at developed ski areas or immediately adjacent areas by lynx may be possible. If lynx use is precluded by habitat alteration or excessively high levels of human activities, Standard ALL S1 directs that new or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area. While nothing is specifically proposed under the CG Plan, the NRLMD does not prohibit the development of recreation sites on Forest lands, therefore lynx may be affected by new developed recreation through habitat alteration or loss. The CG Plan contains a standard that new downhill ski areas would only be approved if existing permitted areas cannot accommodate additional use (FW-STD-RECSKI 01) and a guideline that would require emerging recreation uses such as zip lines, alpine slides and downhill mountain bike trails to be located at existing downhill ski areas if possible (FW-GDL-RECSKI 01). Effects of any new recreation sites may be adverse to lynx due to a reduction in existing snowshoe hare habitat or habitat that may become snowshoe hare habitat in the future. Although effects to denning habitat may occur from new developments, we do not anticipate the effects to be adverse because denning habitat is not limited. The effects associated with any new developments will be analyzed during site-specific consultation, as applicable.

Roads

Unlike paved highways, Forest roads rarely receive motorized use at levels that create barriers or impediments to lynx movements. Lynx have been documented using less-traveled roadbeds for travel and foraging (Koehler and Brittell 1990). Recreational, administrative, and commercial uses of forest roads are known to disturb many species of wildlife. In Montana, Squires et al. (2010) concluded that forest roads with use levels that are low had little effect on how lynx used seasonal resources. Lynx show no preference or avoidance of unpaved forest roads, and the existing road density does not appear to affect lynx habitat selection (McKelvey et al. 2000). The best information suggests that the types of roads managed by the Forest Service do not likely adversely affect lynx. Lynx mortality from vehicle strikes are unlikely, and to date have not been documented on Forest lands in the action area given the relatively slow speeds at which vehicles on these roads travel (due to topography and road conditions) and generally low traffic volumes. Any new permanent road construction may affect lynx. The relatively small amount of snowshoe hare habitat affected within the route prism would be minor and likely insignificant. Temporary routes constructed in snowshoe hare habitat may also have minor impacts on lynx and lynx habitat. However, temporary routes are restored and/or decommissioned such that effects are temporary and not permanent and vegetation grows back. Also, the amount of vegetation and area impacted for the linear structures tends to be limited. Thus, impacts to the lynx and lynx habitat as a result of existing Forest roads and new road construction would likely be insignificant.

To reduce highway effects on lynx, Objective HU O6 guides the Forests to work cooperatively with other agencies to provide for lynx movement and habitat connectivity and to reduce the potential of lynx mortality. While this objective relates to highways, which typically do not occur on Forest land, it encourages cooperation with other agencies in order to reduce the

potential for effects. Several NRLMD guidelines relate to potential impacts of Forest roads, including upgrading (Guideline HU G6), new permanent roads (Guideline HU G7), cutting brush (Guideline HU G8), and new roads built for project use (Guideline HU G9). These guidelines generally discourage improving road access for people and minimize impacts of road construction (permanent and/or temporary) and maintenance on lynx.

Energy and Mineral Development

Mining and energy development on Forest lands in the action area may directly impact lynx. The CG Plan includes desired conditions that energy, mineral and renewable energy are available in consideration of other resource values that may be present. New development could result in small, localized effects to lynx, including effects to lynx habitat. Such effects may include disturbance to lynx and minor amounts habitat removal due to surface disturbance from roads and facilities.

NRLMD Objective HU O5 guides the Forest to manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat. The NRLMD also contains the following three guidelines that would minimize the potential impacts of energy and mineral development on lynx by reducing snow compaction (Guideline HU G4), designing reclamation plans that restore lynx habitat (Guideline HU G5), and limiting winter access to designated routes or designated over-the snow routes (Guideline HU G12). With the application of these measures, the energy and mineral development under the CG Plan would likely result in either no effects or only minor, insignificant effects to lynx depending upon the scale of development.

Linkage Areas

The CG Plan and NRLMD promotes maintenance and improvements in connectivity to the extent that the Forest has authority to influence or control actions that affect connectivity. Connected forest habitats allow lynx to move long distances to find food, cover, and mates. Because the Forest has such large amounts of lynx habitat compared to other land owners, the NRLMD has the ability to impact connectivity.

Squires et al. (2013) concluded that while changes to habitat structure can affect lynx movement, there is no evidence that genetic isolation is an issue. Thus, the main challenges to ensuring linkage for lynx relates to the Forest maintaining permeability for lynx movement. The CG Plan specifically states desired conditions for landscape patterns throughout the Custer Gallatin to provide habitat connectivity for wildlife, particularly wide-ranging species such as medium to large carnivores and wild ungulates (FW-DC-WL 05—07). To help achieve and maintain this desired condition for all wildlife, the revised plan contains a guideline that management actions should not create movement barriers to wide ranging species, except where necessary to provide for human or wildlife safety (FW- GDL-WL 01). Plan components adopted from the NRLMD contain complementary direction specific for lynx to maintain or restore lynx habitat connectivity (Objective ALL O1), with a mandate that new or expanded permanent development

and vegetation management projects must maintain habitat connectivity within and between lynx analysis units (Standard ALL S1).

Standard ALL S1 addresses the impacts to lynx from loss of connectivity within occupied habitat in the action area. Standard ALL S1 requires that new or expanded permanent developments and vegetation management projects in a LAU or linkage area maintain habitat connectivity. Thus, under this standard, Forest Service actions will not be permitted to degrade connectivity in occupied lynx habitat or in linkage areas.

While certain conditions on the ground may impede movement for lynx, there are few management actions in which the Forest Service engages that would create a true barrier to lynx movement, since lynx have the ability go over, under, through, across, or around most obstacles. Some authors (Ruediger et al. 2000, Vanbianchi et al. 2018) have reported that dispersing lynx (i.e. those leaving their natal area or existing home range in search of new home range) are known to travel through suboptimal conditions, including movement through large areas of limited forest cover. However, large-scale developments or features strategically placed in concert with natural barriers such as a large reservoir or cliff wall, can notably affect permeability of the landscape for wildlife. The CG Plan will ensure that management actions that could alter the natural environment would be evaluated for possible impacts on movement patterns of all wide-ranging species and lynx specifically within or between lynx analysis units (FW-GDL-WL 01; NRLMD Standard ALL S1).

The CG Plan includes goals to work with other agencies and landowners to cooperatively manage habitat and provide for connectivity across administrative boundaries, acquire non-federal lands or seek conservation easements where needed to maintain or restore connectivity, and work with highway administrators to reduce vehicle collisions with wildlife (FW-GO-WL 02, 03, 05; FW-GO-LAND 01, FW-GO-RT 03). Plan components adopted from the NRLMD encourage similar conservation measures specific to lynx (Objective LINK O1, Standard LINK S1, Guideline LINK G1; Objective HU O6). Collectively, this direction would ensure that lynx habitat connectivity and potential to reduce impacts to lynx from highway crossings, are considered in future project design criteria as well as cooperative efforts between the Forest Service and other agencies and landowners.

We do not anticipate Forest actions carried out under the CG Plan would result in adverse impacts to lynx connectivity. Such actions are not likely to create a barrier or impede lynx movements. The objective, standards, and guidelines described above would reduce or minimize the potential for effects to lynx in most cases, and therefore the CG Plan, incorporating the NRLMD, would ultimately conserve adequate connectivity with occupied lynx habitat. The site-specific effects of projects proposed under the CG Plan that may impact connectivity would be analyzed during project-specific consultation.

II.A.7. Effects Summary for Canada Lynx

The CG Plan provides a high level of protection for lynx and their habitat through a combination of management area designations and incorporation of lynx-specific standards. Much of the lynx habitat on the Custer Gallatin occurs within large, relatively intact areas that will have management restrictions under the CG Plan (e.g. designated Wilderness, Inventoried Roadless, Recommended Wilderness, or Backcountry Areas). Within the AB GA (core/occupied) where 13 of the Forest's 25 LAUs occur, 86 percent of potential lynx habitat is within management restriction areas. In the MHG GA (secondary, occupied), where 9 of the 25 LAUs occur, management restriction areas will encompass 67 percent of the potential lynx habitat (see BA Errata, U.S. Forest Service 2021, p.1).

The CG Plan incorporates the Northern Rockies Lynx Management Direction (NRLMD), which the Forest Service designed to address those risk factors to lynx that were relevant in terms of Forest Plan direction. Overall, the CG Plan, incorporating the NRLMD, reduces or avoids the potential for adverse effects to lynx. The benefits to lynx come primarily from the vegetation management objectives and implementation of the standards and guidelines. The suite of objectives, standards, and guidelines clearly conserve snowshoe hare and lynx habitat in all occupied, mapped lynx habitat in the action area. Benefits to lynx would likely occur in unoccupied lynx habitat as well, as the Forest will consider the NRLMD in such areas. However, vegetation and fire management activities proposed under the CG Plan may result in some level of adverse effects to lynx, with the main influence from actions that impact snowshoe hare habitat within occupied lynx habitat. The majority of adverse effects to lynx would be a result of the exemptions from (fuel treatment projects in the WUI) and exceptions to (activities for other resource benefit) the NRLMD vegetation standards. As explained above, we do not anticipate adverse effects to lynx from treatment of snowshoe hare habitat within unoccupied lynx habitat. Other than vegetation and fire management, the many activities that may be authorized under the CG Plan are expected to have relatively minor or less substantial impacts on lynx.

Adverse effect to lynx would occur primarily through the temporary impacts to the dense horizontal structure of natural forest succession phases and/or altering the mosaics of the forested landscape in localized areas. A maximum of 46,865 acres of occupied lynx habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 2,260 acres of occupied lynx habitat could be treated using the exceptions for activities for other resource benefit, for a total of 49,125 acres. In short, some vegetative treatments may degrade the function of snowshoe hare habitat by delaying the development of high density snowshoe hare habitat through succession; however, they do not affect that stand's potential to produce snowshoe hare habitat in the future. The habitat would retain its inherent capacity to regenerate. While some amount of vegetation and/or fire management activities may adversely affect areas of snowshoe hare habitat, the amount is expected to be low overall. The acres of lynx habitat that may be treated vegetation and/or fire management activities are not likely all providing snowshoe hare habitat at the same time, if ever, but could potentially provide it at some point over the life of the CG Plan. Thus, although unlikely, the worst case scenario of treating

approximately 49,125 acres of snowshoe hare habitat over the life of the CG Plan is considered for the purpose of this effects analysis. Acres of snowshoe hare habitat treated are expected to be distributed throughout the action area and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs. Thus, adverse effects, while possible, are likely to affect only portions of any individual lynx home range. Any affected LAUs are expected to remain capable of producing adequate densities of snowshoe hares to support lynx presence. Further, many WUI areas occur at lower elevation (i.e. near the lower edge of lynx habitat) and are less likely to be the highest quality lynx habitat, which may reduce the potential overall effect.

We do not anticipate adverse effects to lynx as a result of the vegetation and fire management in stem exclusion stands that do not provide snowshoe hare habitat. We also do not anticipate vegetation and fire management to significantly affect denning habitat. Activities proposed under the CG Plan may result in some disturbance effects to lynx if lynx are in the project area during project implementation. Such disturbance is expected to be insignificant as areas free of disturbance are typically available if a lynx needed to adjust movement patterns during implementation. By following the NRLMD, the CG Plan is expected to maintain habitat connectivity in any given LAU and/or linkage area. We do not expect habitat connectivity or linkage to be adversely affected from vegetation or fire management project conducted under the CG Plan. While vegetation treatments could alter structural stages of potential lynx habitat, they are not likely to result in the construction of any barriers known to inhibit lynx movements. Site-specific projects are not likely to impede lynx movement or reduce habitat connectivity. Treatments proposed under the CG Plan are not expected to preclude any future use of an area by a resident lynx (if present) or a transient lynx should they pass through the area.

II.A.8. Cumulative Effects

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

As previously described, the action area has been defined as the approximately 3,412,020 acres of land within the geographic areas managed by the Forest (BA, U.S. Forest Service 2020, p. 4). Although within the action area, the inholdings of ownerships other than the Forest are not included in the total acreages above and are not subject to Forest management. A total of 11 percent of all the lands within the geographic areas are non-Forest lands, consisting of a mix of state, private, and county lands.

Vegetation projects, fuel treatment projects, mineral extraction, oil and gas exploration, urban and rural development, livestock grazing, recreation site construction and use, road construction, and utility corridors may occur on non-federal lands with the action area and have the potential to affect lynx. Some corporate and small private lands could be managed for timber products and commodities and thus could potentially adversely affect lynx. Some private lands may be

permanently lost to development. Other types of state and private actions are not likely to adversely affect lynx.

The cumulative effects to lynx may range from insignificant to adverse depending on site-specific conditions and actions. As described above, disturbance effects are not likely to be significant as lynx appear to be tolerant of human activity. Depending on site-specific conditions, actions that may affect snowshoe hare habitat could result in some level of adverse effects via the temporary reduction in quantity and/or quality of snowshoe hare habitat or permanent loss due to development. Some non-federal actions may reduce the availability of den sites through removal of coarse woody debris. Because denning habitat is not limiting throughout the action area, any cumulative effects to lynx denning habitat would be insignificant. Since new developments would likely occur at lower elevations, we do not expect such actions would create a barrier or impede lynx movement.

Not all lands would be developed or used in ways that have negative impacts on lynx. Combined, non-federal lands developed or used in ways that would have negative impacts on lynx would constitute a fairly small proportion of lynx habitat within the action area. Many non-federal lands are and would be adjacent to or interspersed with Forest land and therefore, some of the potential negative effects on the private parcels would be moderated by federal land management.

II.A.9. Conclusion

After reviewing the current status of Canada lynx, the environmental baseline for the action area, the effects of the action, the cumulative effects, and the best available information, it is the Service's biological opinion that the effects of the CG Plan on lynx are not likely to jeopardize the continued existence of the Canada lynx. Implementing regulations for section 7 (50 C.F.R. § 402) define "jeopardize the continued existence of" as to "engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."

The best available information describes the importance of snowshoe hare habitat to lynx (Squires et al. 2010, Holbrook et al. 2017, Kosterman et al. 2018). The CG Plan, including implementation of the NRLMD will not preclude continued adequate amounts of snowshoe hare habitat needed to sustain lynx in the LAUs within the action area and thus, the habitat in each of the LAUs would remain functional for lynx. The Service concludes that while site-specific projects carried out under the CG Plan may result in some level of adverse effects to individual lynx, the level of adverse effects are not reasonably expected to appreciably reduce the numbers or distribution of lynx within the action area. Thus, the proposed action is not likely to appreciably reduce the likelihood of survival and recovery of lynx in the wild, and is not likely to jeopardize the continued existence of the contiguous United States Canada lynx DPS.

Our conclusion is based primarily on the information presented in the biological assessment on the CG Plan (U.S. Forest Service 2020), additional information received during the consultation

process, information in our files, and informal discussions between the Service, the Forest, and other personnel. Our rationale for the not likely to jeopardize the continued existence of the Canada lynx conclusion is based on, but not limited to, the following factors summarized below, as detailed earlier in this biological opinion.

- The CG Plan, incorporating the NRLMD, will address the risk factors to lynx and is expected to reduce or avoid the potential for adverse effects to lynx from site-specific activities. The CG Plan clearly conserves and promotes snowshoe hare and lynx habitat within the action area.
- The CG Plan and NRLMD address land management actions that have the most potential to adversely affect key lynx habitat components. While negative effects on lynx may not be totally eliminated, the Service considers the retention of high quality snowshoe hare habitat within occupied lynx habitat as most essential to lynx conservation. The NRLMD vegetation standards directly address the major impacts identified from vegetation management (impacting stand initiation and multi-story stands that provide snowshoe hare habitat). Managing and moderating these impacts will minimize affects to snowshoe hare habitat and production, thus benefiting lynx.
- Site-specific vegetation and fire management projects may result in some level of adverse effects to lynx, primarily through the temporary impacts to the dense horizontal structure of natural forest succession phases and/or altering the mosaics of the forested landscape in localized areas. While negative effects on snowshoe hare habitat and lynx may occur, the CG Plan (by following the NRLMD) is expected to adequately minimize the amount of snowshoe hare habitat treated.
- As described in our biological opinion, the majority of adverse effects that may occur would be a result of actions using the exemptions from and/or exceptions to the NRLMD vegetation management standards. While some amount of vegetation and/or fire management activities may adversely affect areas of snowshoe hare habitat, the amount is expected to be low overall. A maximum of 46,865 acres of occupied lynx habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 2,260 acres of occupied lynx habitat treated using the exceptions for activities for other resource benefit. As previously described, the total treatment of 49,125 acres of snowshoe hare habitat in occupied lynx habitat is not likely to occur. Although unlikely, the worst case scenario of treating approximately 49,125 acres of snowshoe hare habitat over the life of the CG Plan is considered for the purpose of this effects analysis.
- Acres of snowshoe hare habitat treated are expected to be distributed throughout the action area and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs. Thus, while adverse effects are possible, they are likely to affect only portions of any individual lynx home range. Any affected LAUs are expected to remain capable of producing adequate densities of snowshoe hares to support lynx presence.

- The nature of most vegetation management alteration is temporary and reversible (i.e. forests regrow or can be restored). While project-related activities may adversely affect snowshoe hare habitat, effects would be temporary and no permanent loss of the inherent capacity of treated stands to provide lynx habitat is expected. The habitat would retain its inherent capacity to regenerate. Some vegetative treatments may degrade the function of snowshoe hare habitat by delaying the development of high density snowshoe hare habitat. While such actions may change the successional stage of a stand, they do not affect that stand's potential to produce snowshoe hare habitat in the future.
- Further, many WUI areas occur at lower elevation (i.e. near the lower edge of lynx habitat) and are less likely to be the highest quality lynx habitat, which may reduce the potential overall effect.
- It is important to note that mapped lynx habitat consists of a mosaic of various forest structural stages and not all mapped lynx habitat is providing snowshoe hare habitat at the same time. However, at a programmatic scale such as this, it is not possible to accurately map snowshoe hare habitat at every point in time for the life of the CG Plan. Forest structural stages change over time and what is providing snowshoe hare habitat today may not be at some point in the future and what is not providing snowshoe hare habitat today may provide such in the future. In addition, snowshoe hare habitat that may be treated is likely to provide snowshoe hare habitat again, over time. Thus, we are analyzing the maximum amount that could be treated to be sure we do not overlook any potential effect.
- The largest land owner within the Montana portion of the DPS is the Forest Service. The other National Forests also manage their land under the NRLMD, which has either been incorporated into their Forest Plans or has been amended to their Forest Plans. The NRLMD in these Forest Plans and/or amendments have previously undergone section 7 consultation. Portions of the Bureau of Land Management Missoula Field Office (MiFO) is also within lynx habitat and has recently undergone section 7 consultation on their revised resource management plan. While these other National Forests and MiFO may also conduct actions that may adversely affect snowshoe hare habitat and lynx, it was determined by the Service that such effects are not likely to jeopardize the continued existence of the Canada lynx. The impact to snowshoe hare habitat is limited to 6 percent of any individual National Forest, including CG Plan action area, and the MiFO could potentially impact no more than approximately 5,897 acres. As such, approximately 94 percent of occupied lynx habitat within Montana would not be adversely affected. Thus, the overall impacts on lynx in this portion of the DPS is relatively small and would not reduce appreciably the likelihood of both the survival and recovery of Canada lynx within the contiguous United States.
- The CG Plan is a framework programmatic action and does not authorize, fund, or carry out an action but provides direction for future actions that may be authorized, funded, or carried out by the Forest. Since no site-specific projects are planned at this time, it is

difficult to predict what may be proposed and what effects such projects may have. Therefore, any action subsequently authorized, funded, or carried out under the CG Plan will be addressed in subsequent section 7 consultations, as appropriate. Future site-specific consultations on projects will provide both the amount of snowshoe hare habitat within the action area LAU(s) and the amount of snowshoe hare habitat affected by the action, thus, analyzing the specific amount of snowshoe hare habitat that will be affected. We expect that such an analysis will likely reveal that much of the treatments will not occur within snowshoe hare habitat.

- We do not anticipate adverse effects to lynx as a result of the vegetation and fire management in stem exclusion stands that do not provide snowshoe hare habitat.
- We also do not anticipate vegetation and fire management to significantly affect denning habitat.
- The potential adverse effects to lynx due to the exemptions for fuel treatment projects in the WUI and exceptions for activities for other resource benefit are offset by the beneficial effects of the NRLMD. Monitoring and recording of actions are required as decisions are signed to ensure that the number of acres treated through exemptions and/or exceptions do not exceed the amounts described here.
- By following the NRLMD, the CG Plan is expected to maintain habitat connectivity in any given LAU and/or linkage area. We do not expect habitat connectivity or linkage to be adversely affected from vegetation or fire management project conducted under the CG Plan. While vegetation treatments could alter structural stages of potential lynx habitat, they are not likely to result in the construction of any barriers known to inhibit lynx movements. Site-specific projects are not likely to impede lynx movement or reduce habitat connectivity. Treatments proposed under the CG Plan are not expected to preclude any future use of an area by a resident lynx (if present) or a transient lynx should they pass through the area.
- Other than vegetation and fire management, the many activities that may be authorized under the CG Plan are expected to have relatively minor or less substantial impacts on lynx.
- Activities proposed under the CG Plan may result in some disturbance effects to lynx if lynx are in the project area during project implementation. Such disturbance is expected to be insignificant as areas free of disturbance are typically available if a lynx needed to adjust movement patterns during implementation.
- Although unlikely, any other site-specific projects types that may adversely affect lynx are constrained by other standards such as mandating maintenance of connectivity and would likely only affect a relatively small proportion of lynx habitat within the action area. Such actions would undergo site-specific consultation to determine such effects.

- A large proportion of lynx habitat in the action area occurs in lands that cannot be developed (i.e. wilderness), where management focuses on the maintenance of natural ecological processes, or conservation of rare ecological settings or components.

Forest lands in the action area LAUs are expected to provide conditions that would continue to be conducive to supporting lynx over the life of the CG Plan. We conclude that the adverse effects of the CG Plan on lynx would be limited in severity and in scale to the extent that lynx habitat would continue to produce adequate densities of snowshoe hares and adequate levels of cover to support continual lynx presence across the action area. Although some projects carried out under the CG Plan may adversely affect individual lynx, the treatments would likely have small to insignificant and nonpermanent effects on the contiguous United States Canada lynx DPS. Therefore, the proposed action is not likely to jeopardize the continued existence of the Canada lynx.

II.B. BIOLOGICAL OPINION FOR CANADA LYNX DESIGNATED CRITICAL HABITAT

II.B.1. Description of Critical Habitat

The Service published a revised designation of critical habitat for the contiguous United States distinct population segment of the Canada lynx on September 12, 2014, which became effective on October 14, 2014 (79 FR 54782). In total, approximately 38,955 square miles have been designated within five units in the states of Maine, Minnesota, Montana, Wyoming, Idaho, and Washington. The five units contain the physical and biological features essential to the conservation of the lynx as they are comprised of the primary constituent element and its components laid out in the appropriate quantity and spatial arrangement. For a complete description of lynx critical habitat, including information on the primary constituent element, refer to the final rule revising designated critical habitat for lynx (79 FR 54782). This information, along with a brief description of the units, has also been summarized in the 2017 biological opinion on the effects of the NRLMD on Designated Critical Habitat for Canada Lynx (U.S. Fish and Wildlife Service 2017c). These documents (referenced here), include the best available science regarding the status and distribution of designated lynx critical habitat and are incorporated by reference.

Based on this and the current knowledge of the life history, biology, and ecology of lynx, the primary constituent element (PCE) for lynx critical habitat is (79 FR 54811):

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 conditions that provide and maintain deep, fluffy snow 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.

The final rule also described activities that may affect critical habitat and therefore should result in consultation. These activities include, but are not limited to: (79 FR 54827):

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 within the critical habitat units.

Further, the rule notes that in matrix habitat, activities that change vegetation structure or condition would not be considered an adverse effect to lynx critical habitat unless those activities would create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat within a potential home range, or if they adversely affect adjacent foraging or denning habitat.

II.B.2. Analysis of Critical Habitat Likely to be Affected

The biological assessment determined that the CG Plan may adversely affect lynx critical habitat. Therefore, formal consultation with the Service was initiated and this biological opinion has been written to determine whether or not activities associated with this action are likely to result in the destruction or adverse modification of designated Canada lynx critical habitat.

II.B.3. Environmental Baseline

Under the provisions of section 7(a)(2), when considering the "effects of the action" on listed species and designated critical habitat, the Service is required to consider the environmental

baseline. Regulations implementing the Act (50 C.F.R. § 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in progress. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

The action area for the analysis of effects of the CG Plan on lynx critical habitat includes the GAs that occur within the portion of designated lynx critical habitat Unit 5, Greater Yellowstone Area critical habitat unit. Approximately 1,434,687 acres of designated critical habitat for lynx, or nearly 25 percent of the total designated critical habitat in Unit 5, falls within the boundary of the Custer Gallatin National Forest; of that, roughly 1,363,814 acres (95%) is on NFS lands. Critical habitat is designated in those portions of the Custer Gallatin with the highest potential to support residential lynx use over time, which is located in the AB and MHG GAs. Within the AB GA, all of the LAUs are mapped critical habitat. Within the MHG GA, only four LAUs contain lynx critical habitat—the West Gallatin, North Gallatin, East Gallatin, and Gardiner-Tom Miner LAUs, all of which are east of Highway 191. The remaining areas of the Forest have not been designated as lynx critical habitat, and thus are not part of the analysis area for critical habitat for lynx.

In order to fully address effects of the CG Plan, the Forest provided a broad scale estimate of the PCE across the action area, intended to provide an overall picture of the current status of lynx critical habitat. LAUs will be used to analyze effects to lynx at the site-specific, project scale. LAUs are typically large enough to represent the average home range size of a female lynx and contain adequate habitat and landscapes to support lynx year-round, providing a sufficient landscape to assess the effects of site-specific projects on individual lynx but not so large as to dilute the potential effects of an action.

II.B.4. Status of Critical Habitat within the Action Area

The action area contains the physical or biological elements essential for the conservation of the species, including the PCE. Stand initiation habitat, including early stand initiation habitat, potentially provides for PCE 1a; multi-story habitat potentially provides PCE 1a and/or 1c; the critical habitat within action area generally provides deep, fluffy snow conditions (PCE 1b); habitat such as stem exclusion is one of the boreal forest successional stages comprising the PCE, also potentially providing denning habitat PCE 1c; and areas of critical habitat not mapped as lynx habitat generally provide matrix habitat (PCE 1d).

PCE 1a (Snowshoe hare habitat) in the action area is generally comprised of young forests in stand initiation and older, multi-story forests. Early stand initiation stands are very young

regenerating stands characterized by dense growth of young trees, providing abundant forage and hiding cover for snowshoe hare during the summer. In the winter, these stands are covered by snow and unavailable to snowshoe hares. As they age, these stands will likely transition into stand initiation phase, where trees have grown tall enough to protrude above the snow, and provide forage and dense hiding cover for snowshoe hares in the winter and summer. Multi-story forests with dense horizontal cover (a dense understory of young trees and shrubs) provide both lynx and snowshoe hares with abundant forage and hiding cover during summer and winter. Summer habitat is not believed to limit snowshoe hare or lynx populations. However, winter habitat is believed to be a factor limiting snowshoe hare and lynx populations (Squires et al 2010, Interagency Lynx Biology Team 2013).

Stands of trees with a relatively closed overstory canopy and limited understory vegetation are characterized as stem exclusion habitat. These phases are forest successional stages that are part of the boreal forest landscape described in the critical habitat PCE. Little light reaches the forest floor so understory vegetation (including trees) are shaded and grow slowly; shrubs become dormant and new trees are precluded by a lack of sunlight and/or moisture. Thus, these structural stages do not currently provide snowshoe hare habitat due to the lack of horizontal cover described in PCE 1a. In some stem exclusion stands, a limited amount of snowshoe hare forage may be available during the summer as a greater variety and quantity of deciduous forage and cover is available to hares due to the lack of snow cover and the growth of seasonal vegetation. This summer habitat is covered by snow during the winter and is unavailable to hares or lynx.

Winter conditions that provide and maintain deep, fluffy snow conditions for extended periods in boreal forest landscapes (PCE 1b) occur throughout the action area. These conditions likely restrict potential lynx competitors from effectively encroaching on or hunting snowshoe hares in winter lynx habitat. In addition to snow depth, other snow properties, including surface hardness or sinking depth, also influence lynx foraging success.

Lynx den sites (PCE 1c) are generally found in mature spruce-fir forests among downed logs or root wads in areas with abundant coarse woody debris and dense understories with high horizontal cover. Downed trees provide cover for den sites and kittens and are often associated with dense woody stem growth. The structural components of lynx den sites are common features in both managed and unmanaged stands. Because lynx have large home ranges and low den site fidelity, most lynx populations are not limited by a lack of immediate den sites (Squires et al. 2008).

As mentioned, the NRLMD focuses on maintaining and improving snowshoe hare habitat within mapped lynx habitat. Areas that are not mapped as lynx habitat generally do not have the inherent potential to produce snowshoe hares at densities that would support lynx residency and reproduction. The Service designated critical habitat on Forest lands that in some instances were not mapped as lynx habitat by the Forest. This situation occurs where critical habitat, specifically PCE 1d, was designated in areas of ‘matrix’ habitat. The identification and description and use of the term “matrix habitat” did not arise until the designation of critical

habitat. Matrix habitat is comprised of patches of habitat types that occur within or adjacent to boreal forest and do not have the capacity to produce high density snowshoe hare habitat. These habitat types typically consist of dry forest, hardwood forest, or non-forested habitat types. Matrix habitat cannot become lynx habitat through forest succession. Lynx use matrix habitat to travel within their home range, but do not depend upon it for prey species or denning sites.

Projects that occur within matrix habitat must still be analyzed for potential effects to PCE 1d. As for all critical habitat, including matrix habitat, the guidance in the Service's 2014 critical habitat designation (79 FR 54782) may be used to assess and/or reduce or avoid negative effects on critical habitat. As stated in the final rule, activities that change vegetation structure or condition in matrix habitat are not considered an adverse effect to lynx critical habitat unless those activities create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat or if they adversely affect adjacent foraging and denning habitat.

Fire and other natural disturbance processes, both currently and historically, played an important role in maintaining a mosaic of forest successional stages that provides habitat for both snowshoe hare and lynx (Ruediger et al. 2000, Interagency Lynx Biology Team 2013), including the PCE for lynx critical habitat. Fire regimes are variable having both - frequent (35-100 years) stand-replacing or mixed severity fires and infrequent (200+ years) stand replacement fires. Within the past 70 years, land management agencies began effective fire suppression with the advent of aircraft support. This fire exclusion has the potential to alter vegetation mosaics and species composition that may reduce the quality of lynx critical habitat. In western forests, fire exclusion in areas with a history of infrequent fire return intervals has probably not had much impact. But areas where the fire regime was historically frequent or mixed has generally shifted to more intense fire regimes, resulting in forest compositions and structures that are more homogeneous, composed of more shade-tolerant species with more canopy layers, and are more susceptible to severe fires, insects, and diseases.

Lynx critical habitat was mapped and then modeled for vegetative structural stage. Table 17 of the biological assessment (U.S. Forest Service 2020) displays the amount of lynx critical habitat within the action area. Within the total of 1,363,814 acres of lynx critical habitat, approximately 251,877 acres are mapped as snowshoe hare habitat (PCE 1a) and 518,701 acres are mapped as denning habitat (PCE 1c; these numbers overlap, meaning some acres provide both PCE 1a and 1c at this time). The remaining 773,369 acres (57 percent) are mapped as PCE 1d, or matrix habitat. The acres represent a broad scale estimate intended to provide an overall picture of the current status of lynx critical habitat in the action area and do not represent the level of precision necessary for project level analyses. These are the estimated current conditions, however the habitat related to PCE 1a and PCE 1c is expected to change over time as a result of succession and forest growth as well as changes related to disturbances such as fire, harvest, pre-commercial thinning, and insect infestations.

II.B.5. Factors Affecting Critical Habitat Within the Action Area

This section identifies and describes key areas of Forest management that affect the environment for lynx critical habitat. These factors include vegetation management (including fire management), livestock management, human use, and linkage areas. Existing management related to these factors is summarized below. The biological assessment provides additional information on the existing condition related to the following factors and is incorporated by reference (U.S. Forest Service 2020).

On March 23, 2007, the Service issued a biological opinion and incidental take statement on the effects of the NRLMD on the Distinct Population Segment of Canada lynx (lynx) in the contiguous United States (U.S. Fish and Wildlife Service 2007), in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The Service determined that the NRLMD was not likely to jeopardize lynx (*Ibid.*). The NRLMD was amended to both the Custer and Gallatin National Forests and is the current lynx direction in both plans. In 2017, the Service issued an amended incidental take statement, which included a five-year extension of the time-frame to implement the NRLMD. Also in 2017, the Service issued a biological opinion on the effects of the NRLMD on designated lynx critical habitat (U.S. Fish and Wildlife Service 2017c). The Service determined that the NRLMD was not likely to result in the destruction or adverse modification of designated Canada lynx critical habitat (*Ibid.*).

The NRLMD applies to occupied, mapped lynx habitat within LAUs on the Forest. The NRLMD provides direction primarily for lynx habitat management to avoid or reduce the potential for projects proposed under Forest Plans to adversely affect lynx. The direction accomplishes this through a suite of standards and guidelines that reduce or avoid adverse effects on lynx from land management activities primarily by reducing or avoiding adverse effects on lynx habitat that provides snowshoe hare habitat (lynx foraging habitat). Thus, the NRLMD promotes and conserves the habitat conditions needed to produce snowshoe hare (lynx primary prey) densities that are adequate to sustain lynx within their home ranges, and thus sustain lynx populations and promote recovery of Canada lynx. In doing so, the NRLMD also promotes and conserves lynx critical habitat, including the PCE. Some exemptions and exceptions to avoiding adverse effects to lynx, and thus, adverse effects to PCE 1a, may occur within the WUI to protect human safety and property or for activities for other resource benefits and are described below.

Vegetation Management

Vegetation management includes activities that change the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. Harvesting has been used within the action area as a tool to achieve a variety of resource objectives, including but not limited to lowering fuels and fire risk; establishing desired tree species; improving tree growth; reducing impacts of insects or disease; contributing wood

products to the local economy; improving wildlife habitat; and salvaging the economic value of trees killed by fire or other factors.

A considerable proportion (55%) of designated critical habitat for lynx on the CGNF is currently within designated wilderness, where mechanical vegetation management, most permanent development, and roads are prohibited. An additional 28 percent is similarly protected within a wilderness study area, inventoried roadless areas, and recommended wilderness, for a total of 83% of designated critical habitat within protected areas where management practices are unlikely to result in adverse effects. While timber harvest and production are allowed within lynx critical habitat under the existing Forest plans, actual use on the ground is constrained by resource-specific standards and guidelines, including the NRLMD.

The vegetation management standards and guidelines in the NRLMD work together to promote the vegetation management objectives. Based on the best available information, the Service concluded that the NRLMD would conserve the most important components of lynx habitat: a mosaic of early and mature multi-story forests with high levels of horizontal cover and structure. These components ensure habitat that maintains its inherent capability to support both snowshoe hare prey base and adequate lynx foraging habitat (PCE 1a) and denning habitat (PCE 1c). As the NRLMD will be carried over unchanged, the effects of the baseline condition will be very similar to the effects of the CG Plan. Thus, a detailed analysis of the NRLMD will be provided in effects section below.

The NRLMD standards and guidelines are applicable and required for all vegetation management actions in occupied, mapped lynx habitat within the action area. Much of this habitat is also designated as lynx critical habitat. As analyzed below, areas within the WUI (totaling approximately 6 percent of mapped lynx habitat on the Forest) are exempt from the standards; however Guideline VEG G10 would apply and requires consideration of the standards in designing fuel treatment projects. Collectively, application of the vegetation management standards and guidelines avoids most adverse effects to lynx critical habitat. For the purposes of the NRLMD, vegetation management 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 wildland fire use.

The NRLMD includes exemptions from Standards VEG S1, VEG S2, VEG S5, and VEG S6 to allow for fuel treatment projects within the WUI. In addition, exceptions listed in VEG S5 and VEG S6 would allow some activities for other resource benefit such as to protect structures, for research, and/or to promote the conservation of tree species such as whitebark pine and aspen. These exemptions and exceptions would allow actions that may have adverse effects on lynx critical habitat by reducing the horizontal structure of natural forest succession phases, and/or affecting the mosaics of the forested landscape in localized areas, thus, effecting PCE 1a (snowshoe hare habitat).

In the 2017 consultation on the effects of the NRLMD on lynx critical habitat, the Forest Service provided explicit estimates on the maximum number of acres of PCE 1a that could be adversely

impacted under the exemptions and exceptions. In our 2017 biological opinion on the effects of the NRLMD on lynx critical habitat, we analyzed the effects of such impacts on lynx critical habitat. The Custer and Gallatin portions of the Forest were listed separately because the two forests were administratively separate at the time of the NRMLD record of decision. On the Custer portion of the Forest, adverse effects could occur as a result of up to 7,144 acres of PCE 1a treated under the WUI exemption and up to 1,000 acres of PCE 1a treated under the exceptions for other resource benefits. Since issuance of the 2017 biological opinion, the Custer portion of the Forest has treated 231 acres of PCE 1a using the WUI exemption or the other resource benefits exception. On the Gallatin portion of the Forest, adverse effects could occur as a result of up to 28,058 acres of PCE 1a treated under the WUI exemption and up to 1,270 acres of PCE 1a treated under the exceptions for other resource benefits. Since issuance of the 2017 biological opinion, the Gallatin portion of the Forest has not treated any acres of PCE 1a using the WUI exemption or the other resource benefits exception. The Forest treated 900 acres of PCE 1a between 2007 and 2017 using the exemptions and/or exceptions to the NRLMD; these effects were captured in site-specific project consultations and are not discussed further here.

Fire Management

Wildfire has a strong influence on the age distribution and spatial arrangement of forest vegetation. Current management of wildland fire is guided by plans and policies at the Forest, regional, and national level, all of which are frequently evaluated and updated. Wildland fire has been present in the action area to an increasing extent since the mid-1980s, particularly in designated wilderness areas. 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 that burn are largely influenced by weather/climate, vegetation, and terrain. Within the action area, some lynx critical habitat has been impacted by wildfire from 1987 to 2019 (many of these fires predated the designation of critical habitat). Past and ongoing fuels reduction projects would be accounted for in the vegetation management described in the paragraphs above.

Livestock Management

Within the AB and MHG GAs, where lynx critical habitat occurs, the Forest currently permits 65 active and 17 vacant livestock grazing allotments (BA, U.S. Forest Service 2020, p. 118). Grazing operations follow the NRLMD guidelines (GRAZ G1, G2, G3, and G4) in occupied lynx habitat, which is also providing lynx critical habitat. Overall, grazing should be made compatible with improving or maintaining lynx critical habitat (GRAZ O1).

Human Use

Recreation Management

Developed recreation sites are sites or facilities with features that are intended to accommodate public use and recreation, such as campgrounds, rental cabins, fire lookouts, summer homes, and

visitor centers. Recreation on the Forest 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 Forest is also influenced by numerous area designations that define or limit types of activities occurring within them, including designated wilderness, wilderness study act areas, RWAs, IRAs, eligible wild and scenic rivers, scenic byways, recreation areas, and others.

Currently 83 percent of the designated lynx critical habitat falls within protected areas (BA, U.S. Forest Service 2020, p. 82), where recreation is primarily non-motorized and dispersed. Of the critical habitat in the action area, 66 percent occurs in designated wilderness, 10 percent in wilderness study area, 17 percent in Inventoried Roadless Areas, and 1 percent in areas identified as recommended wilderness. In addition to the limits associated with vegetation management described above, other human uses are constrained in these areas. Motorized and mechanized travel, including motorized over-snow travel, is restricted in designated wilderness and recommended wilderness. Portions of the wilderness study area are recommended wilderness. Recreation management in designated wilderness and recommended wilderness focuses on providing primitive experiences where the presence of humans is minimized. The NRLMD includes a number of objectives and guidelines intended to limit potential effects to lynx from various recreational activities (HU O1, O2, O3, O4; HU G1, G2, G3, G10, and G11). These objectives and guidelines also limit potential effects to lynx critical habitat.

Two developed alpine ski areas are located on the Forest. Red Lodge Ski Area occurs within the AB GA, in lynx critical habitat. Bridger Bowl Ski Area occurs within the BBC GA, outside of lynx critical habitat. Winter recreation activities are guided by the human use objectives and guidelines in the NRLMD.

Roads

Some portions of the action area are highly roaded while other portions have low road densities. Summer motorized recreation is allowable on approximately 17 percent of lynx critical habitat. For more information on the existing conditions related to motorized access in across the Forest, see information in the grizzly bear chapter for discussion of roads in the AB GA and the MHG BA (not all of the roads in the MHG BA are located within lynx critical habitat).

Snowmobile Use

Presently, over-the-snow motor vehicle use is allowed with the geographic areas located in lynx critical habitat. Over-the-snow motor vehicle use can be described by where it occurs on designated trails (miles of trails) and where it occurs in designated winter recreation areas that allow for off-trail (acres) use. Approximately 326 miles of over-the-snow motor vehicle use trails, with 244 miles of those being groomed, occur within LAUs in occupied lynx habitat, most of which contains critical habitat. Where over-the-snow motor vehicle use can occur off-trail in

winter recreation areas, this use generally does not occur within snowshoe hare habitat (PCE 1a). It primarily occurs in open parks, sparse forests, and other areas that do not provide cover or forage for snowshoe hares.

Energy and Mineral Development

Mineral development refers to surface and underground hardrock mining and coal production, which are regulated by permits on the Forest. Oil and gas production are conducted through a leasing process. Lands on the Forest 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 includes but may not be limited to campgrounds, administrative sites, or other identified developed sites.

The only commercial hardrock mining rights on the Forest are for the Stillwater Complex located in the AB GA, which is within lynx critical habitat. Mining is currently active at that site.

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 law and regulations. Forest plans guide the specific manner in which the activities allowed by mineral leases or permits are carried out on the ground. Locatable mineral uses are managed through Plans of Operation and Notices of Intent that are developed at the time specific plans for minerals exploration or development are submitted to the Forest. The Forest review Plans of Operation or Notices of Intent as they are received every year, each of which generally disturbs less than 1 acre. The actual number that are active in any given year changes and is generally dependent on the market price for the minerals of interest. Minerals and energy development in occupied lynx habitat (and critical habitat) are subject to the standards and guidelines in the NRLMD, including HU O5 and HU G4, G5, G6, G7, G8, G9, and G12.

Climate Change

The lynx is a cold-climate and snow-adapted habitat and prey specialist. Thus, the species, as well as designated lynx critical habitat, is vulnerable to climate warming, especially at the southern periphery of its range (U.S. Fish and Wildlife Service 2017a). As noted in the critical habitat final rule, climate change is a threat to the PCE (79 FR 54810). By the end of this century in Units 3 and 5, climate change is expected to result in reduced snow duration and quality, and the upslope contraction of snow conditions favorable for lynx (79 FR 54825). Climate change is also extending fire prone seasons and can result in larger and higher intensity wildfires than occurred historically; such events are more likely in fire adapted western forests where active fire suppression over the past 60 years has interrupted historic fire regimes (Ruediger et al. 2000). In general, climate change can directly affect both snowshoe hare and lynx population dynamics, and has the potential to adversely affect the lynx critical habitat PCE over the long term.

Continued climate warming is expected to diminish boreal forest habitats and snow conditions at the southern edge of the range that are, in some places, already patchily-distributed and perhaps only marginally capable of supporting resident lynx (*Ibid.*). Although projected climate warming is expected to reduce the future distribution and number of lynx, a substantial uncertainty about the timing, rate, magnitude, and extent of potential impacts that may affect lynx remains. Despite these uncertainties, specific effects of climate warming on lynx, hares, and their habitats in the range of lynx can be reasonably anticipated include: (1) northward and upslope contraction of boreal spruce-fir forest types, (2) northward and upslope contraction of snow conditions believed to favor lynx over other terrestrial hare predators, (3) reduced hare populations and densities, and (4) changes in the frequency, pattern, and intensity of forest disturbance events. Other potential effects of projected warming include: (5) reduced gene flow between Canadian and DPS lynx populations, (6) changes in the periodicity and amplitude of northern hare cycles, which could result in reduced lynx immigration to the DPS from Canada, and (7) increased or novel diseases and parasites. Each of these factors is discussed in detail in the Species Status Assessment for the Canada lynx (U.S. Fish and Wildlife Service 2017a). Despite concerns about the long-term persistence of lynx, experts projected that resident lynx populations are very likely to persist in all 5 geographic units that currently support them in the near-term (year 2025) and mid-term (2050), and uncertainty was great regarding predictions beyond that time frame (*Ibid.*).

II.B.6. Effects of the Action on Critical Habitat

Under section 7(a)(2) of the Act, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 C.F.R. § 402.02). The effects discussed below are the result of implementing the CG Plan.

As described above in the lynx analysis, the CG Plan retains the objectives, goals, standards, guidelines, and monitoring requirements from the NRLMD in its entirety. The direction in the NRLMD will be applied to projects occurring in occupied lynx habitat, which covers all of the designated lynx critical habitat on the Custer Gallatin National Forest. This biological opinion on the effects of the CG Plan on lynx critical habitat supersedes our 2017 biological opinion on the effects of the NRLMD lynx critical habitat.

Our effects analysis is based on what the CG Plan (and NRLMD) permits or prohibits, as well as a quantitative assessment of the effects to lynx critical habitat from actions that have the most potential to negatively affect lynx. The analysis includes an estimate of acres of PCE 1a that may be treated under future actions using the exemptions from and/or exceptions to the NRLMD standards that are incorporated into the CG Plan. While we analyze what the CG Plan would allow, many activities that are allowed by the CG Plan direction are never fully carried out for a variety of reasons, such as funding limitations and environmental or policy considerations.

However, the following sections analyze the potential effects to lynx critical habitat from full implementation of activities that may occur under the direction in the CG Plan.

Vegetation Management

Vegetation management includes activities that change the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. For the purposes of this analysis, vegetation management 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 wildland fire use. Vegetation management can have beneficial, neutral, or adverse effects on lynx critical habitat.

Under the CG Plan, timber harvest (removal of trees for varied reasons) could occur in lynx critical habitat in areas where such activities are otherwise permitted. Because 84 percent of critical habitat occurs within land use designations that prohibit or limit timber harvest, the actual area that could potentially be harvested is a small portion of the critical habitat on the Forest. The NRLMD components in the CG Plan will be applied to timber production and timber harvest activities in lynx critical habitat.

The Forest Service has identified four objectives related to vegetation management that would improve the quality of lynx critical habitat by improving conditions for prey: (1) manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx (NRLMD Objective VEG O1); (2) provide a mosaic of habitat conditions through time that support dense horizontal cover and high densities of snowshoe hare, and provide winter snowshoe hare habitat in both the stand initiation structural stage and in the mature, multi-story conifer vegetation (NRLMD Objective VEG O2); (3) conduct fire use activities to restore ecological processes and maintain or improve lynx habitat (NRLMD Objective VEG O3); and (4) focus vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover (NRLMD Objective VEG O4).

Forest management activities can result in a conversion of vegetation types. For example, silvicultural prescriptions might be designed to change species composition to favor ponderosa pine, which has a high economic value, at the expense of lodgepole pine, which has low economic value but provides better lynx habitat. This kind of stand type conversion could negatively affect lynx critical habitat. The NRLMD Objectives VEG O1, O2, O3, and O4 reduce the potential for adverse effects to lynx from such conversions of habitat. Attainment of the vegetation management objectives through projects designed using vegetation management standards and guidelines would support lynx survival and conservation. With the application of these measures, we do not anticipate that the proposed action would adversely affect lynx critical habitat via habitat conversions within the action area.

The primary factors driving lynx populations, behavior, and distribution is the abundance and distribution of snowshoe hares. Vegetation management or natural fire can setback vegetation succession to an early stand initiation structural stage, which may be used by snowshoe hares during the summer but is snow-covered and thus unavailable to hares during the winter. Eventually these stands regenerate into a stand initiation structural stage, providing high stem densities and horizontal structure extending above the snowpack during winter, and become high quality snowshoe hare habitat (Squires et al. 2010, Kosterman 2014, Holbrook et al. 2017, Holbrook et al. 2018). Older forested stands also provide high quality habitat when they provide multi-story mature or late successional forests that provide high horizontal cover for both lynx and snowshoe hare (Murray et al. 1994, Squires et al. 2010, Kosterman 2014, Holbrook et al. 2017, Kosterman et al. 2018, Holbrook et al. 2019). In Montana, these stands were used consistently by both lynx and snowshoe hare during the winter (Squires et al. 2010). These stands, along with stands in a stand initiation structural stage (including early stand initiation), provide the landscape mosaic of habitat conditions needed for snowshoe hare production and lynx foraging habitat (Kosterman 2014, Kosterman et al. 2018), and thus provide for PCE 1a.

Standards VEG S1, VEG S2, VEG S5, and VEG S6 would lead to attainment of the vegetation objectives described above by limiting the disturbance to snowshoe hare habitat and ensuring that enough habitat within each LAU would be available to provide lynx with sufficient snowshoe hare prey and lynx foraging habitat conditions (PCE 1a). Under Standard VEG S1, if more than 30 percent of lynx habitat in an LAU is in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects. Additionally, Standard VEG S2 requires that timber management projects shall not regenerate (i.e., change to stand initiation structural stage) more than 15 percent of lynx habitat within an LAU in a 10-year period. While some treatment may result in regenerating lynx habitat to stand initiation structural stages, these young stands typically contain high stem densities and horizontal cover, which provides summer habitat and eventually grows into essential winter foraging habitat for snowshoe hares. Vegetation Standards VEG S1 and VEG S2 promote a balance, a mosaic, of young and older stands within each LAU.

Thinning stand initiation structural stages can reduce horizontal cover that is critical to maintain the snowshoe hare prey base (PCE 1a). High horizontal cover is important to hares and lynx. Reducing dense horizontal structure through silvicultural thinning would likely reduce an area's carrying capacity for snowshoe hares (Ruggiero et al. 2000; Griffin and Mills 2004, 2007; Homyack et al 2007; Interagency Lynx Biology Team 2013). By deferring precommercial thinning that reduces snowshoe hare habitat until the stand no longer provides winter snowshoe hare habitat, Standard VEG S5 ensures that stand initiation snowshoe hare and lynx habitat (PCE 1a) is not degraded. This standard protects and maintains the high stem densities that provide high quality snowshoe hare forage during summer and/or winter seasons and maintains the inherent capacity of the habitat to produce snowshoe hares and provide for PCE 1a.

As previously mentioned, lynx preferentially forage in spruce-fir forests with high horizontal cover, abundant hares, deep snow, and large-diameter trees during the winter. The high

horizontal cover found in multi-story conifer stands is a major factor affecting winter hare densities. During winter, snowshoe hares were consistently found in multi-story forest stands. These older, multi-story stands provide forage, hiding cover, and likely thermal cover for both snowshoe hares and lynx. Standard VEG S6 precludes vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late successional forests. This standard protects mature, multi-story habitat that provides a dense understory and high quality snowshoe hare habitat and also maintains the inherent capacity of the habitat to produce snowshoe hares and provide for PCE 1a.

NRLMD Guideline VEG G1 directs that vegetation management projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority for treatment should be given to stem-exclusion, closed-canopy structural stage stands to enhance habitat conditions for lynx or their prey. In other words, emphasis should be on those stands that do not currently provide snowshoe hare habitat, which in turn may improve snowshoe hare habitat (PCE 1a) over the long-term. Adverse effects to lynx critical habitat are not anticipated as a result of treatments in a stem exclusion or similar stage. Such stands are characterized as having a closed canopy with limited understory, lacking dense cover preferred by hares and are generally not progressing towards year-round snowshoe hare habitat. Treatment of stem exclusion stands would open up the stands and encourage an increase in horizontal cover (understory regeneration). Thus, treatments in these stands do not reduce existing snowshoe hare habitat (PCE 1a) and have the potential to improve the habitat for snowshoe hares by either creating openings to allow understory growth or stimulating the regeneration of dense stands of young trees used by hares.

Vegetation management typically does not influence the overall winter conditions that provide and maintain deep fluffy snow for extended periods of time (PCE 1b), as such conditions are a function of topography and climate. However, actions may result in some level of localized snow compaction, which could promote an increase in use by potential lynx competitors (i.e. other terrestrial predators of hares like coyotes and bobcats). As explained further in the recreation management section below, we have no evidence that snow compaction facilitates increased competition to a level that negatively affects lynx (Kolbe et al 2007, Interagency Lynx Biology Team 2013, 79 FR 54829). Further minimizing the potential for snow compaction related to vegetation management, Guideline VEG G4 directs that prescribed fire activities should not create permanent travel routes that facilitate snow compaction and that constructing permanent firebreaks on ridges or saddles should be avoided. Thus, while vegetation management may affect PCE 1b to some degree via localized snow compaction, we expect any effects would be insignificant.

Guideline VEG G5 is focused on habitat for alternate prey species, primarily red squirrel, and directs that such habitat should be provided in each LAU. Red squirrel habitat typically contains snags and downed wood, generally associated with mature or older forests, which may be used by lynx for denning (PCE 1c) if the required components are provided and it is in close proximity to snowshoe hare habitat. Guideline VEG G11 directs that denning habitat (PCE 1c) should be distributed in each LAU in the form of pockets of large amounts of large woody

debris, either down logs or root wads, or large piles of small wind thrown trees (“jack-strawed” piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles, or residual trees to provide denning habitat in the future. Denning habitat elements are generally found distributed across the action area. Vegetation management projects may result in localized effects to PCE 1c by removing existing coarse woody material and/or affecting its recruitment. This can affect the quality and quantity of available lynx denning habitat (PCE 1c). In most cases, denning habitat is not known to be limited within lynx habitat in the action area, and the vegetation management objectives, standards, and guidelines either directly or indirectly promote the development and retention of adequate amounts of denning habitat. In the cases where PCE 1c may be affected by vegetation management, Guidelines VEG G5 and VEG G11 would apply and would minimize the potential for effects by requiring that such habitat be provided and well distributed. Therefore, vegetation management is unlikely to result in adverse effects to PCE 1c.

While the vegetation management direction does not include standards and guidelines specific to matrix habitat (PCE 1d), as matrix habitat is not mapped as lynx habitat, we do not expect vegetation management activities that are implemented under the CG Plan to have adverse impacts on PCE 1d. As described in the 2014 lynx critical habitat final rule, activities in matrix habitat that change vegetation structure or conditions would not be considered an adverse effect to lynx critical habitat unless those activities would create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat within a potential home range, or if they would adversely affect adjacent foraging habitat or denning habitat (FR 79 54827). While vegetation management activities may effect vegetation within PCE 1d, we do not expect that such activities would affect the ability of a lynx to travel through such habitat because vegetation management is not likely to create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat within a potential lynx home range. As such, the effects from vegetation management that occur within PCE 1d would be insignificant.

The vegetation management standards and guidelines work together to promote the vegetation management objectives. In addition to the vegetation management standards, standard ALL S1 also applies to vegetation management projects in that vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area. Having this standard apply to each LAU (which represents a lynx home range) would maintain connectivity among LAUs and throughout the larger landscape, thus minimizing the potential impacts to habitat connectivity and linkage areas from vegetation management. Site-specific projects are not likely to impede lynx movement or reduce habitat connectivity. We do not expect habitat connectivity or linkage to be adversely affected from vegetation management projects conducted under the CG Plan. Treatments within lynx critical habitat proposed under the CG Plan are not expected to preclude any future use of an area by a resident lynx (if present) or a transient lynx should they pass through the area.

Based on the best available information, the Service concludes that the NRLMD within the CG Plan would conserve the most important components of lynx critical habitat: a mosaic of early

and mature multi-story forests with high levels of horizontal cover and structure. These components ensure habitat that maintains its inherent capability to support both snowshoe hare prey base and adequate lynx foraging habitat (PCE 1a) and denning habitat (PCE 1c). As analyzed below, areas within the WUI (totaling approximately 6 percent of occupied lynx habitat) are exempt from the standards. However, Guideline VEG G10 would apply and requires consideration of the standards in designing fuel treatment projects. Where these standards and guidelines are applied to vegetation management projects, we anticipate few projects, if any, would have adverse effects on lynx critical habitat. Collectively, application of the NRLMD vegetation standards and guidelines is expected to avoid most adverse effects to lynx critical habitat and the PCE would continue to serve its intended conservation role for lynx.

Exemptions from and exceptions to vegetation management standards for fuel treatment projects in the WUI and activities for other resource benefit

The NRLMD includes exemptions from Standards VEG S1, VEG S2, VEG S5, and VEG S6 to allow for fuel treatment projects within the WUI. In addition, exceptions listed in VEG S5 and VEG S6 would allow some activities for other resource benefit such as to protect structures, for research, and/or to promote the conservation of tree species such as whitebark pine and aspen. These exemptions and exceptions would allow actions that may have adverse effects on lynx critical habitat, specifically PCE 1a, by reducing the horizontal structure of natural forest succession phases, and/or affecting the mosaics of the forested landscape in localized areas. For the same reasons as explained above, we do not expect adverse effects to PCE 1b, 1c, 1d, or stem exclusion habitat from vegetation management using the exemptions and/or exceptions.

Based on the most current lynx habitat mapping for the Custer Gallatin (updated for plan revision), there are approximately 590,445 acres of lynx habitat (not matrix) in designated critical habitat. Under the CG Plan, the Forest estimates that it may treat up to 34,205 acres of PCE 1a using exemptions for fuel treatment projects within the WUI, and an additional 2,260 acres of lynx critical habitat PCE 1a could be treated using the exceptions for activities for other resource benefit (USFS 2020, p. 85, 96). Thus the Forest estimates the total maximum amount of PCE 1a that could be treated under the CG Plan and NRLMD standards is 36,465 acres, which is approximately 3 percent of the total amount of critical habitat in the action area, and 6 percent of the mapped lynx habitat within critical habitat. These acres are not likely all providing PCE 1a but could potentially provide it at some point over the life of the CG Plan and could potentially result in adverse effects to lynx critical habitat via impacts to PCE 1a.

Based on the amount of PCE 1a treated over the past 14 years, it is highly unlikely that all of the acres of PCE 1a that could be treated under the exemptions from and exceptions to the vegetation management standards would actually be treated. The biological assessment reports the amount of PCE 1a that has previously been treated using WUI exemptions since 2007 was 990 acres (BA, U.S. Forest Service 2020, p. 85), and the Forest treated two other projects totaling 231 acres since the BA was submitted (email communication from J. Hemenway, 14 October, 2021). The CG Plan includes objectives to accelerate fuel treatment projects within WUI, and thus it is reasonable to assume that fuel treatment projects in designated critical habitat for lynx using the

NRLMD exemptions would be accelerated relative to projects implemented under existing plans. However, new plan component FW-STD-WLLX 02 combined with standards adopted from the NRLMD (Standards VEG S5 and VEG S6) would prohibit management actions from exceeding 34,205 acres using WUI exemptions. Because future activities are unknown, the maximum amount of PCE 1a that could be treated over the life of the CG Plan, and in turn may adversely affect lynx critical habitat, is analyzed here.

It is important to note that mapped lynx habitat consists of a mosaic of various forest structural stages and not all mapped lynx habitat is providing PCE 1a at the same time. However, at a programmatic scale such as the CG Plan, it is not possible to accurately map PCE 1a at every point in time over the life of the plan. Forest structural stages change over time and what is providing PCE 1a today may not be at some point in the future and what is not providing PCE 1a today may provide such in the future. In addition, treated areas have the potential to provide PCE 1a again, over time. Thus, we are analyzing the maximum amount that could be treated to be sure we do not overlook any potential effect. While the amounts provided in Table II-5 displays the maximum amounts of PCE 1a that could be treated, it is not expected that this maximum would be reached all at the same time and will likely never be reached.

Table II-5. Acres of PCE1a that may be treated in lynx critical habitat under the CG Plan using the exemptions from and/or exceptions to the NRLMD vegetation standards (adapted from U.S. Forest Service 2020).

Designated Critical Habitat	Acres
Total Lynx Critical Habitat in the Action Area	1,363,814
Mapped lynx habitat within Lynx Critical Habitat	590,445
Maximum PCE 1a Treated Using Exemptions for Fuel Treatment Projects in the WUI	34,205
Maximum PCE 1a Treated Using Exceptions for Activities for Other Resource Benefits	2,260
Total PCE 1a Treated Using Exemptions and/or Exceptions	36,465
Percent of PCE 1a Treated within Lynx Critical Habitat	3 %
Percent of PCE 1a Treated within mapped lynx habitat within Lynx Critical Habitat	6%

The CG Plan is a framework programmatic action and does not authorize, fund, or carry out an action but provides direction for future actions that may be authorized, funded, or carried out by the Forest. Since no site-specific projects are planned at this time, it is difficult to predict what may be proposed and what effects such projects may have. Therefore, any action subsequently authorized, funded, or carried out under the CG Plan will be addressed in subsequent section 7 consultations, as appropriate. Future site-specific consultations on projects will provide both the amount of PCE 1a within the action area LAU(s) and the amount of PCE 1a affected by the action, thus, analyzing the specific amount of PCE 1a that will be affected. Based on the history

of vegetation management on the Forest, we expect that such an analysis will likely reveal that much of the treatments will not occur within PCE 1a.

For perspective on the total amount of PCE 1a that may be treated with projects that may adversely affect lynx critical habitat, the average home range size of a lynx was reported as 53,375 acres for males and 21,745 acres for females (Squires et al. 2004). Acres treated are expected to be distributed throughout the LAUs within lynx critical habitat and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs. Thus, adverse effects, while possible, are likely to affect only portions of any individual lynx home range. Further, many of the WUI areas occur at lower elevation (i.e. near the lower edge of lynx habitat) and are less likely to be the highest quality lynx habitat, which may reduce the potential overall effect of the exemptions. Under the NRLMD, vegetation management that adversely affects lynx critical habitat, specifically PCE 1a, would not be allowed in the majority of lynx critical habitat.

The exemption from Standard VEG S1 for fuel treatment projects within the WUI would affect the forest mosaic by allowing more than 30 percent of lynx habitat within an LAU to be in a stand initiation structural stage not yet providing winter snowshoe hare habitat. The exemption for fuel treatment projects in the WUI in Standard VEG S2 would allow more than 15 percent of an LAU to be regenerated to a stand initiation structural stage within a decade. Where exemptions from Standards VEG S1 or VEG S2 are used within the WUI, adverse effects to lynx critical habitat may occur by temporarily reducing the quality and productivity of PCE 1a until treated stands begin to provide snowshoe hare habitat.

The exemption from Standard VEG S5 for fuel treatment projects in the WUI would reduce natural levels of horizontal structure in early successional phases by allowing precommercial thinning during the stand initiation structural stage, prior to when the stand no longer provides winter snowshoe hare habitat. It is well documented that such thinning in hare habitat results in a corresponding decrease in the abundance of snowshoe hares (see Ruggiero et al. 2000). Thinning dense stands of young trees may adversely affect lynx critical habitat by reducing the capacity of these stands to produce snowshoe hares and provide PCE 1a. Similarly, the exemption for fuel treatment projects in the WUI from Standard VEG S6 would likewise allow management actions that would reduce the horizontal cover and thus the quantity and quality of PCE 1a in older, multi-story stands, potentially resulting in adverse effects to lynx critical habitat. Research has documented the importance of these multi-story stands as foraging habitat for lynx and for hares (Squires et al. 2010), especially during the winter months. Thus, exemptions in either Standard VEG S5 or VEG S6 may reduce the capacity of an LAU to support lynx reproduction and/or occupancy.

Overall, the NRLMD limits the exemptions from Standards VEG S5 and VEG S6 to areas within the WUI and the anticipated adverse effects under the CG Plan would occur on no more than 34,205 acres of PCE 1a, distributed across lynx critical habitat within the action area. The site-specific impact would depend upon the size of the treated area as well as the inherent capacity of the site to produce snowshoe hares and may not always result in adverse effects. In addition, in

most cases, these reductions are temporary as vegetation typically grows back and would likely provide PCE 1a again, over time.

While exemptions are in place for fuel treatment projects in the WUI, Guideline VEG G10 directs that such projects should be designed considering Standards VEG S1, VEG S2, VEG S5, and VEG S6 to promote conservation. Thus, while some adverse effects to lynx critical habitat (specifically PCE 1a) may occur by use of the exemptions, consideration of the standards in designing fuel treatment projects may result in minimizing such effects.

The NRLMD also allows exceptions to Standards VEG S5 and VEG S6 for activities that would protect structures from wildfire, for research, to conserve other vegetation communities such as whitebark pine and aspen, and/or for incidental removal during salvage harvest. Such treatment could reduce the quantity and/or quality of PCE 1a by reducing the horizontal cover, potentially affecting the ability of an LAU to support lynx reproduction and/or occupancy. The maximum amount of treatment of PCE 1a allowed under the exceptions to the Standards VEG S5 and VEG S6 is 2,260 acres throughout the action area. However, the site-specific impact would depend upon the size of the treated area as well as the inherent capacity of the site to produce snowshoe hares and may not always result in adverse effects.

In summary, vegetation management under the CG Plan implementing the NRLMD would promote forested landscape patterns that maintain or restore lynx habitat. This positive effect would occur within lynx critical habitat with the exception of treatments of PCE 1a associated with vegetation management exemptions and/or exceptions. Actions implemented under the exemptions from and/or exceptions to the vegetation standards of the NRLMD may affect lynx critical habitat. Adverse effects to lynx critical habitat as a result of these exemptions and exceptions may occur specifically due to the treatment of PCE 1a or snowshoe hare habitat, including treating up to 36,465 acres of PCE 1a.

The conservation role of lynx critical habitat is to support viable core area lynx populations. PCE 1a would be diminished primarily through the removal of the dense horizontal structure of natural forest succession phases and/or altering the mosaics of the forested landscape in localized areas. The activities that treat PCE 1a may have adverse effects on lynx critical habitat by temporarily reducing snowshoe hare forage and numbers.

Although the exemptions from and exceptions to vegetation management standards may result in some adverse effects to lynx critical habitat, vegetation objectives, standards, and guidelines overall would contribute to creating and maintaining landscape patterns that sustain snowshoe hare and lynx populations. No permanent loss (such as paving or building construction) of habitat or conversion of the boreal forest would occur as a result of vegetation management under the NRLMD. Some vegetative treatments may degrade the function of the PCE by delaying the development of high density snowshoe hare habitat through succession; however, they do not remove the PCE from the site. The habitat would retain its inherent capacity to regenerate and while such actions may change the successional stage of a stand, they do not affect that stand's potential to produce PCE 1a in the future. Although vegetation management

under the NRLMD may adversely affect areas of critical habitat, specifically PCE 1a, any affected LAUs are expected to remain capable of producing adequate densities of snowshoe hares to support continual lynx presence and would continue to serve their intended conservation role for lynx.

Fire Management

The CG 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. Under the CG Plan, naturally occurring fire would continue to be a primary driver of ecosystem processes on much of the Forest.

Wildfire may result in the reduction of PCE 1a (snowshoe hare habitat), temporarily reducing an area's ability to provide lynx foraging habitat. Conversely, wildfire can regenerate habitat that currently does not provide PCE 1a to an early stand initiation structural stage, which may then move towards providing year-round PCE 1a.

In certain areas, however, wildfire would be managed to protect resources at risk. Wildfire suppression has the potential to alter vegetation mosaics and species composition that may reduce the quality and/or quantity of lynx habitat. In western forests, fire exclusion in areas with a history of infrequent fire return intervals has probably not had much impact. But areas where the fire regime was historically frequent or mixed has generally shifted to more intense fire regimes, resulting in forest compositions and structures that are more homogeneous, composed of more shade-tolerant species with more canopy layers, and are more susceptible to severe fires, insects, and diseases. The effects associated with wildfire decisions such as suppression activities will be analyzed during site-specific emergency consultation procedures as applicable.

Livestock Management

Livestock management includes grazing of livestock on Forest lands. Livestock may compete with snowshoe hares for forage resources (Ruediger et al. 2000). Browsing or grazing also could impact plant communities that connect patches of lynx habitat within a home range. Snowshoe hare habitat such as riparian willow and aspen communities are most likely to be affected by grazing (Interagency Lynx Biology Team 2013). Conversely, appropriate grazing management can rejuvenate and increase forage and browse in some habitats. At the time of the lynx listing, the Service found no evidence that grazing was a factor threatening lynx, therefore, grazing was not addressed in the final lynx listing rule (March 24, 2000; 65 FR 16052). Overall, grazing is not likely to reduce the snowshoe hare prey base or have substantial effects on lynx (Interagency Lynx Biology Team 2013). As such, there is no existing research that provides evidence of lynx critical habitat being adversely affected by grazing or of lynx movements within home ranges being impeded by grazing practices.

The NRLMD identifies one objective and four guidelines related to livestock management. Objective GRAZ O1 directs the Forest to manage livestock grazing to be compatible with improving or maintaining lynx habitat. The NRLMD would reduce the potential for grazing to affect lynx critical habitat through the guidelines for livestock management practices that provide for: regeneration of trees and shrubs (Guideline GRAZ G1), aspen stands (Guideline GRAZ G2), riparian areas and willow cars (Guideline GRAZ G3), and shrub-steppe habitats (Guideline GRAZ G4). These guidelines should adequately minimize the potential for effects of grazing to lynx critical habitat and may improve the habitat over baseline conditions.

The quality and quantity of snowshoe hare habitat (PCE 1a) would not be significantly diminished as a result of grazing livestock. Livestock management is not likely to affect snow conditions (PCE 1b). Effects to lynx denning habitat (PCE 1c) would likely be none to very negligible. Impacts to matrix habitat (PCE 1d) would not create a barrier or impede lynx movement within a potential home range. With the application of the NRLMD guidelines, the effects of grazing across the action area would be minimal and livestock management under the CG Plan is expected to either have no effects to lynx critical habitat or have insignificant and/or discountable effects to lynx critical habitat depending on site-specific information. Thus, the PCE and its components (PCE 1a, 1b, 1c, and 1d), would not be significantly affected. Lynx critical habitat would continue to serve the intended conservation role for lynx.

Human Use Projects

Human use projects include actions such as recreation management, Forest roads, snowmobile use, and mineral and energy development. Recreation management includes developed ski areas, winter dispersed recreation, and non-winter dispersed recreation. Below we analyze the effects to lynx critical habitat in general. It is important to note that not all developed areas on Forest lands would be considered critical habitat. From the final rule (79 FR 54823): *“Given the scale of the lynx critical habitat units, it was not feasible to completely avoid inclusion of ...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 also been excluded by text in this rule.”*

Under the revised plan, a large proportion (77 percent) of the potential lynx habitat within designated critical habitat would be within protective designations and forest plan land allocations that would not permit large new permanent developments (U.S. Forest Service 2021).

Recreation Management

The CG Plan designates or identifies specific areas in which management would emphasize recreation values, such as the Cooke City Recreation Emphasis Area, and others. The CG Plan also identifies one existing alpine ski area within lynx critical habitat (Red Lodge Ski Area).

Management or development of recreation sites or facilities would occur in compliance with recreation settings.

The main effect of non-winter recreation is potential disturbance to lynx rather than effects to habitat. While studies that have considered the reactions of lynx to human presence are few, anecdotal information does suggest that lynx are rather tolerant of humans (Interagency Lynx Biology Team 2013). Due to the low susceptibility of lynx to displacement by humans, non-winter recreation presents low risk of effects to how lynx use critical habitat. Effects to the PCE from non-winter recreation, including effects to PCE 1a, 1b, 1c, and/or 1d, are not likely to be adverse.

Dispersed winter recreational uses and activities, such as snowmobiling, cross-country skiing, and snowshoeing occur within lynx critical habitat and are expected to continue to occur under the CG Plan. The range of lynx is restricted to forested areas with deep snow conditions (PCE 1b) during the winter. Lynx evolved in and are highly adapted to a boreal forest environment. Morphologically, lynx are well-adapted to hunting snowshoe hares in deep snow (Murray and Boutin 1991) in densely forested environments. Lynx have very large feet in relation to body mass, which prevents them from sinking deep into snow. This provides lynx with an inherent competitive advantage over many other mammalian carnivores in deep snow conditions. Their primary prey, snowshoe hare, are also adapted to living in dense boreal forests in areas with abundant snow. Within the last century, coyotes have expanded their range from western and central prairie regions in North America to forests of the east and far north. Morphologically, coyotes are at a disadvantage hunting in high snow areas, as their feet are fairly small in relation to body mass and they therefore sink into soft snow (Murray and Boutin 1991).

To date, research has confirmed that lynx and coyote populations coexist, despite dietary overlap and competition for snowshoe hare 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 from within the action area (an area populated by both lynx and coyotes) concludes that coyotes did not require compacted snow routes to access winter snowshoe hare habitat (Kolbe et al 2007, Interagency Lynx Biology Team 2013). In our final rule (March 24, 2000; 65 FR 16052), snow compaction created by human activities was not found to be a threat to the lynx DPS. We also have no evidence that packed snow trails facilitated competition to a level that negatively affects lynx or lynx populations.

The CG Plan includes NRLMD Objective HU O1 to maintain the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat. In addition, recreation activities should be managed to maintain lynx habitat and connectivity (Objective HU O2) and rather than developing new areas in lynx habitat, activities should be concentrated in existing developed areas (Objective HU O3). The NRLMD Guideline HU G11 states that designated over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction, unless designation serves to consolidate use and improve lynx habitat. Further, Guideline HU G12

limits winter access for non-recreation special uses and mineral and energy exploration and development to designated routes or designated over-the-snow routes.

Winter dispersed recreation such as snowmobiling is unlikely to affect PCE 1a, 1c, or 1d. Insignificant effects to PCE 1b may indirectly occur via snow compaction. However, while snow compaction may occur, the areas of compaction are localized. Nearly 84 percent of the areas within critical habitat that contain persistent snow will be within a management designation or allocation that will not allow motorized over snow use (BA, U.S. Forest Service 2020, p. 88). In addition, snow compaction does not impact the overall ability for winter conditions to provide and maintain deep fluffy snow for extended periods of time. Thus, adverse effects from winter dispersed recreation are not anticipated.

Inside designated critical habitat for lynx, there is one Recreation Emphasis Area (REA) specifically identified for winter use, which covers just over 24,000 acres near Cooke City in the Absaroka-Beartooth Geographic Area. Due to the high elevation, alpine nature of this area, not all of the Cooke City winter REA is within designated critical habitat for lynx; roughly 13,700 acres of the REA are within the persistent snow element of critical habitat (PCE 1b). Snow compaction associated with winter recreation in the portion of the Cooke City REA within critical habitat would affect just over 1 percent of the total persistent snow element (PCE 1b) on the Forest.

Developed recreation can result in the direct loss of lynx critical habitat, and depending on the structural stage, could affect PCE 1a, 1c, and/or 1d. Developments such as ski areas can result in permanent loss of lynx habitat through the development of permanently groomed runs and resort infrastructure, such as lift termini, buildings and roads. Some loss of lynx habitat may be unavoidable with development, but at the scale of the Forest, relatively small areas are affected.

Of the five ski areas (two alpine and three Nordic) operating on the CGNF, only one, Red Lodge Mountain Resort (alpine area) is within designated critical habitat for lynx. Roughly 2,300 acres of the special use permit area for Red Lodge Mountain is within designated critical habitat. The CG Plan would allow new downhill (alpine) ski areas only if existing ski areas could not be expanded to accommodate additional use (FW-STD-RECSKI 01), and would locate new downhill recreation uses within existing permitted areas (FW-GDL-RECSKI 01). New Nordic ski areas could be considered under the revised plan, but the NRLMD (Guideline HU G3) would require that any such development and associated operations be designed to provide for lynx movement and to maintain the effectiveness of lynx habitat.

Based on the information provided by the critical habitat final rule (79 FR 54823), the developed portions of the Red Lodge Ski Area that lack the PCE for lynx would be excluded from the critical habitat designation (*“Given the scale of the lynx critical habitat units, it was not feasible to completely avoid inclusion of ...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 also been excluded by text in this rule”). While the development itself may not be designated as lynx critical habitat, it can affect the way lynx use the adjacent critical habitat. It is unlikely that the ongoing effects of the Red Lodge Ski Area are resulting in adverse effects to lynx critical habitat. The ski area is not likely to negatively affect connectivity with lynx habitat as it does not create a barrier or impede lynx movement.

The NRLMD includes objectives, standards, and guidelines that address the most serious consequence of development, requiring new or expanding permanent developments to maintain or where possible, promote habitat connectivity within LAUs and linkage areas (Objective All O1, Standard All S1, Guideline All G1, Objective LINK O1, and Standard LINK S1). Recreational activities should be managed to maintain lynx habitat and connectivity (Objective HU O1), with activities concentrated in existing developed areas, rather than developing new areas in lynx habitat (Objective HU O3). Objective HU O4 provides for lynx habitat needs and connectivity when developing new or expanding existing developed recreation sites or ski areas.

Several guidelines in the NRLMD reduce impacts within the development itself, including: adequately sized inter-trail islands that support winter snowshoe hare habitat (Guideline HU G1), providing foraging habitat for lynx that is consistent with the ski area’s operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes (Guideline HU G2), provide for lynx movement and maintain the effectiveness of lynx habitat (Guideline HU G3), and consider the location of access roads and lift termini to maintain and provide lynx secure habitat if identified as a need (Guideline HU G10).

Some use of lynx critical habitat at developed ski areas (winter recreation) or immediately adjacent areas by lynx is possible. If lynx use is precluded by habitat alteration or excessively high levels of human activities, Standard ALL S1 directs that new or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area. While nothing is specifically proposed under the CG Plan, the NRLMD does not prohibit the development of recreation sites on Forest lands, therefore lynx critical habitat may be affected by new developed recreation through habitat alteration or loss. Such effects may sometimes be adverse via a reduction in existing snowshoe hare habitat (PCE 1a) or habitat that may become snowshoe hare habitat in the future. Although effects to winter snow conditions (PCE 1b) (via compaction) and denning habitat (PCE 1c) may occur from new developments, we do not anticipate the effects to be adverse because overall winter conditions are not influenced and denning habitat is not limited. We also do not anticipate adverse effects to matrix habitat (PCE 1d) because the scale would not be expected to create a barrier or impede lynx movement within an LAU.

In summary, recreation management under the CG Plan is not expected to result in adverse effects to lynx critical habitat. However, the effects associated with any new developments will be analyzed during site-specific consultation as applicable. The NRLMD as a whole has objectives, standards, and guidelines to reduce the potential for impacts and lynx critical habitat would continue to serve the intended conservation role for lynx.

Roads

Unlike paved highways, Forest roads rarely receive motorized use at levels that create barriers or impediments to lynx movements. Lynx have been documented using less-traveled roadbeds for travel and foraging (Koehler and Brittell 1990). Recreational, administrative, and commercial uses of forest roads are known to disturb many species of wildlife. In Montana, Squires et al. (2010) concluded that forest roads with use levels that are low had little effect on how lynx used seasonal resources. Lynx show no preference or avoidance of unpaved forest roads, and the existing road density does not appear to affect lynx habitat selection (McKelvey et al. 2000). The best information suggests that the types of roads managed by the Forest Service are not likely to adversely affect lynx. Lynx mortality from vehicle strikes are unlikely given the relatively slow speeds at which vehicles on these roads travel (due to topography and road conditions) and generally low traffic volumes. Any new permanent road construction may affect lynx critical habitat. The relatively small amount of PCE 1a affected within the route prism would be minor and likely insignificant. Temporary routes constructed in snowshoe hare habitat may also have minor impacts on lynx critical habitat. However, temporary routes are restored and/or decommissioned such that effects are temporary and not permanent and vegetation grows back. Also, the amount of vegetation and area impacted for the linear structures tends to be limited. Thus, impacts to the PCE and its components would likely be insignificant as a result of temporary road construction.

To reduce highway effects on lynx, Objective HU O6 directs the Forests to work cooperatively with other agencies to provide for lynx movement and habitat connectivity and to reduce the potential of lynx mortality. While this objective relates to highways, which typically do not occur on Forest land, it encourages cooperation with other agencies in order to reduce the potential for effects. Several guidelines relate to potential impacts of Forest roads, including upgrading (Guideline HU G6), new permanent roads (Guideline HU G7), cutting brush (Guideline HU G8), and new roads built for project use (Guideline HU G9). These guidelines generally discourage improving road access for people and minimize impacts of road construction (permanent and/or temporary) and maintenance on lynx critical habitat.

As described in the critical habitat final rule (79 FR 54823) human-made structures including paved and gravel roadbeds, parking lots, and other structures that lack the PCE for the lynx, are not intended to be designated as critical habitat and have been excluded by text. While the roadbed itself may not be designated as lynx critical habitat, it can affect the way lynx use the adjacent habitat. However, based on the information above, we do not anticipate any effects to lynx critical habitat related to roads to be significant or adverse. Lynx critical habitat would continue to serve the intended conservation role for lynx.

Energy and Mineral Development

Mining and energy development on Forest lands in the action area may directly impact lynx critical habitat. The CG Plan includes desired conditions that energy, mineral and renewable energy are available in consideration of other resource values that may be present. New development could result in small, localized effects to lynx critical habitat, including PCE 1a, 1c,

and or 1d. Such effects may include minor amounts habitat removal due to surface disturbance from roads and facilities.

NRLMD Objective HU O5 directs the Forest to manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat. The NRLMD also contains the following three guidelines that would minimize the potential impacts of energy and mineral development on lynx by remote monitoring to reduce snow compaction (Guideline HU G4), reclamation plans that restore lynx habitat (Guideline HU G5), and limitations on winter access to designated routes or designated over-the snow routes (Guideline HU G12). With the application of these measures, the energy and mineral development under the CG Plan would likely result in either no effects or only minor, insignificant effects to lynx critical habitat depending upon the scale of development. Lynx critical habitat would continue to serve its intended conservation role for lynx.

Linkage Areas

The CG Plan and NRLMD promotes maintenance and improvements in connectivity to the extent that the Forest has authority to influence or control actions that affect connectivity. Connected forest habitats allow lynx to move long distances to find food, cover, and mates. Because the Forest has such large amounts of lynx habitat compared to other land owners, the NRLMD has the ability to impact connectivity.

In addition to NRLMD objectives, standards, and guidelines related to site-specific actions, the following objective, standard, and guidelines apply to all Forest projects within linkage areas in occupied habitat, subject to valid existing rights. Such management direction is incorporated to improve connectivity. Objective Link O1 directs the Forests to work with landowners in areas of intermingled land ownership to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat. Coordination among different land management agencies is important to lynx critical habitat because lynx have large home ranges and may move long distances. Thus, without coordination, the effects of mixed ownership patterns on lynx critical habitat would likely lead to reductions in habitat connectivity. Standard LINK S1 requires the Forests to identify potential highway crossings when highway or forest highway construction or reconstruction is proposed in linkage areas. In addition, Guideline LINK G1 guides Forests to retain Forest land in public ownership and Guideline LINK G2 guides management of livestock grazing in shrub steppe habitats to contribute to maintaining or achieving a preponderance of mid- to late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.

In addition, Standard ALL S1 addresses the impacts to lynx critical habitat from loss of connectivity within occupied habitat in the action area. Standard ALL S1 requires that new or expanded permanent developments and vegetation management projects in a LAU or linkage

area maintain habitat connectivity. Thus, under this standard, Forest Service actions will not be permitted to degrade connectivity in lynx habitat or in linkage areas within lynx critical habitat.

The objective, standards, and guidelines described above would reduce or minimize the potential for effects to lynx in most cases, and therefore the NRLMD would ultimately conserve adequate connectivity with lynx critical habitat. The site-specific effects of projects proposed under the CG Plan that may impact connectivity would be analyzed during project-specific consultation. Squires et al. (2013) concluded that while changes to habitat structure can affect lynx movement, there is no evidence that genetic isolation is an issue. We do not anticipate Forest actions carried out under the CG Plan would result in adverse impacts to lynx connectivity. Such actions are not likely to create a barrier or impede lynx movements. Thus, under the CG Plan and NRLMD, linkage and connectivity within lynx critical habitat would continue to serve their intended conservation role for lynx.

II.B.7. Effects Summary for Lynx Critical Habitat

The Forest Service designed the NRLMD to address those risk factors to lynx that were relevant in terms of Forest Plan direction. Overall, the NRLMD reduces or avoids the potential for adverse effects to lynx critical habitat. The benefits to lynx critical habitat from the CG Plan, along with the NRLMD, come primarily from the vegetation management objectives and implementation of the standards and guidelines. This suite of objectives, standards, and guidelines clearly conserve snowshoe hare habitat (PCE 1a) and other lynx critical habitat in the action area.

However, vegetation and fire management activities proposed under the CG Plan may result in some level of adverse effects to lynx critical habitat, specifically PCE 1a. The majority of adverse effects to lynx critical habitat would be a result of the exemptions from (fuel treatment projects in the WUI) and exceptions to (activities for other resource benefit) the vegetation standards. Other than vegetation and fire management, many activities that may be authorized under the CG Plan are expected to have relatively minor or less substantial impacts on lynx critical habitat and the PCE.

Adverse effect to lynx critical habitat would occur primarily through the temporary removal of the dense horizontal structure of natural forest succession phases and/or altering the mosaics of the forested landscape in localized areas. We anticipate adverse effects to lynx critical habitat only from the vegetation and fire management actions proposed under the CG Plan that occur within PCE 1a (snowshoe hare habitat). A maximum of 34,205 acres of lynx critical habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 2,260 acres of lynx critical habitat could be treated using the exceptions for activities for other resource benefit. In short, some vegetative treatments may temporarily degrade the function of PCE 1a by delaying the development of high density snowshoe hare habitat through succession; however, they do not affect that stand's potential to produce PCE 1a in the future. The habitat would retain its inherent capacity to regenerate. While some amount of vegetation and/or fire management activities may adversely affect areas of PCE 1a, based on the Forest's

vegetation management history, the amount is expected to be low overall. The acres of lynx habitat that may be treated under vegetation and/or fire management activities are not likely all providing snowshoe hare habitat at the same time, if ever, but could potentially provide it at some point over the life of the CG Plan. Thus, although unlikely, the worst case scenario of treating approximately 36,465 acres of PCE 1a over the life of the CG Plan is considered for the purpose of this effects analysis. Acres of PCE 1a treated are expected to be distributed throughout the action area and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs. Thus, while adverse effects are possible, they are likely to affect only portions of any individual lynx home range. Any affected LAUs are expected to remain capable of producing adequate densities of snowshoe hares to support lynx presence. Further, many WUI areas occur at lower elevation (i.e. near the lower edge of lynx habitat) and are less likely to be the highest quality lynx habitat, which may reduce the potential overall effect.

We do not anticipate adverse effects to lynx critical habitat as a result of the vegetation and fire management in stem exclusion stands that do not provide PCE 1a. We also do not anticipate vegetation and fire management to significantly affect winter snow conditions (PCE 1b), areas that provide PCE1c (denning habitat), or areas that provide PCE1d (matrix habitat). By following the NRLMD, the CG Plan is expected to maintain habitat connectivity in any given LAU and/or linkage area. We do not expect habitat connectivity or linkage to be adversely affected from vegetation or fire management project conducted under the CG Plan. While vegetation treatments could alter structural stages of potential lynx habitat, they are not likely to result in the construction of any barriers known to inhibit lynx movements. Site-specific projects are not likely to impede lynx movement or reduce habitat connectivity. Treatments proposed under the CG Plan are not expected to preclude any future use of an area by a resident lynx (if present) or a transient lynx should they pass through the area.

Although the exemptions from and exceptions to the NRLMD vegetation management standards may result in some level of adverse effects to lynx critical habitat, specifically to PCE 1a, vegetation objectives, standards, and guidelines overall would contribute to creating and maintaining landscape patterns that sustain snowshoe hare and lynx populations. Lynx critical habitat in the action area is expected to remain capable of producing adequate densities of snowshoe hares to support continual lynx presence and would continue to serve their intended conservation role for lynx.

II.B.8. Cumulative Effects to Critical Habitat

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

As previously described, the action area has been defined as the GAs that occur within the portion of designated lynx critical habitat Unit 5, Greater Yellowstone Area critical habitat unit. This includes the Absaroka GA, and the portion of the Madison Henry's Lake Gallatin (MHG)

GA east of Highway 191. Approximately 70,872 acres of non-federal lands occur within the action area. These lands account for approximately 5 percent of the designated critical habitat for lynx inside the CGNF boundary, and include state-owned wildlife management areas, private land and land owned by the city of Bozeman. The Forest manages the majority (95 percent) of lynx critical habitat within the action area.

Vegetation projects, fuel treatment projects, mineral extraction, oil and gas exploration, urban and rural development, recreation site construction and use, road construction, and utility corridors may occur on non-federal lands with the action area and have the potential to affect lynx critical habitat and the PCE components. The cumulative effects to lynx critical habitat may range from insignificant to adverse depending on site-specific conditions and actions.

Some corporate and small private lands could be managed for timber products and commodities and thus could potentially adversely affect lynx critical habitat, specifically PCE 1a. Depending on site-specific conditions, actions that may affect PCE 1a could result in some level of adverse effects via the temporary reduction in quantity and/or quality of snowshoe hare habitat or permanent loss due to development. All five Montana counties that overlap designated critical habitat for lynx on the CGNF (Gallatin, Park, Sweet Grass, Stillwater and Carbon counties) have Community Wildfire Protection Plans (CWPPs), which identify areas on non-federal lands in greatest need of fuel reduction treatment, and recommend effective and efficient measures to reduce fire risk to man-made structures (USDA 2004). CWPPs could encourage non-federal land owners to conduct fuel treatment projects in lynx habitat that may reduce snowshoe hare habitat, or otherwise temporarily or permanently alter lynx habitat. Other types of non-federal actions would not be likely to adversely affect PCE 1a.

Some non-federal actions may slightly impact localized snow conditions (PCE 1b) via snow compaction. However, we do not expect such actions to significantly affect the overall winter conditions that provide and maintain deep fluffy snow for extended period of time. Some non-federal actions may reduce the availability of den sites (PCE 1c) through removal of coarse woody debris. Because denning habitat is not limiting throughout the action area, any cumulative effects to PCE 1c would be insignificant. Vegetation management and/or development of private lands to support increased human populations will likely continue and may reduce habitat connectivity in matrix habitat (PCE 1d). Since new developments would likely occur at lower elevations and because the amount of private land within the action area is very small, we do not expect such actions would create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat within in a potential lynx home range. Thus, cumulative impacts to PCE 1d would likely be insignificant.

Not all lands would be developed or used in ways that have negative impacts on lynx critical habitat. Combined, non-federal lands developed or used in ways that would have negative impacts on lynx critical habitat would constitute a fairly small proportion of lynx critical habitat within the action area. Many non-federal lands are and would be adjacent to or interspersed with Forest land and therefore, some of the potential negative effects on the non-federal parcels would be moderated by federal land management. Therefore, we anticipate that the lynx critical habitat

within the action area would retain its current ability for the PCE to function and critical habitat would continue to serve its intended conservation role for the species.

II.B.9. Conclusion for Critical Habitat

After reviewing the current status of designated lynx critical habitat, the environmental baseline for the action area, the effects of the action, the cumulative effects, and best available information, it is the Service's biological opinion that the effects of the CG Plan are not likely to result in the destruction or adverse modification of designated Canada lynx critical habitat. Implementing regulations for section 7 define "destruction or adverse modification" as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (81 FR 7216). The Lynx Critical Habitat Final Rule (79 FR 54826) explains that "*the key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species. Activities that may destroy or adversely modify critical habitat are those that alter the physical or biological features to an extent that appreciably reduces the conservation value of critical habitat for the lynx DPS.*" The role of critical habitat is to support life-history needs of the species and provide for conservation of the species.

The best available information describes the importance of snowshoe hare habitat (PCE 1a) to lynx (Squires et al. 2010, Holbrook et al. 2017, Kosterman et al. 2018). The CG Plan, including implementation of the NRLMD will not preclude continued adequate amounts of PCE 1a needed to sustain lynx in the LAUs within the action area and thus, the critical habitat in each of the LAUs would remain functional. When added to the status of the critical habitat units, the effects of the action are such that the conservation role of the lynx Critical Habitat Unit 5 will continue to serve its intended conservation role for lynx and the physical or biological features, including the PCE components essential to the conservation of lynx, will not be altered to a point that precludes or significantly delays development of these features. Thus, the Service concludes that while the CG Plan may result in some level of adverse effects to lynx critical habitat, the level of adverse effects are not reasonably expected to result in an alteration that appreciably diminishes the value of critical habitat for the conservation of lynx.

Our conclusion is based primarily on the information presented in the biological assessment on the CG Plan (U.S. Forest Service 2020), additional information received during the consultation process, information in our files, and informal discussions between the Service, the Forest, and other personnel. Our rationale for the no destruction or adverse modification conclusion is based on, but not limited to the following factors summarized below, as detailed earlier in this biological opinion.

- The CG Plan and NRLMD address land management actions that have the most potential to adversely affect key lynx habitat components. The CG Plan, along with the NRLMD

that is to be followed under the CG Plan, clearly conserves and promotes snowshoe hare and lynx habitat within the action area, including lynx critical habitat.

- While negative effects on lynx critical habitat may not be totally eliminated, the Service considers the retention of high quality snowshoe hare habitat (PCE 1a) within in lynx critical habitat as most essential to lynx conservation. The NRLMD vegetation standards directly address the major impacts identified from vegetation management (impacting stand initiation and multi-story stands that provide PCE 1a). Managing and moderating these impacts will minimize affects to snowshoe hare habitat and production, thus minimizing impacts to PCE 1a.
- However, as described in our biological opinion, site-specific vegetation and fire management projects may result in some level of adverse effects to lynx critical habitat PCE 1a, primarily through the temporary removal of the dense horizontal structure of natural forest succession phases and/or altering the mosaics of the forested landscape in localized areas. While negative effects on PCE 1a may occur, the CG Plan, by following the NRLMD, is expected to adequately minimize the amount of PCE 1a treated throughout the life of the plan.
- Moreover, for those areas that provide lynx critical habitat but not PCE 1a, we do not anticipate the CG Plan and NRLMD to result in adverse effects to the remaining PCE and components, including PCE 1b (deep fluffy snow), PCE 1c (denning habitat), PCE 1d (matrix habitat), and stem exclusion habitat (part of the PCE boreal forest).
- As described in our biological opinion, the majority of adverse effects that may occur would be a result of actions using the exemptions from and/or exceptions to the NRLMD vegetation management standards. While some amount of vegetation and/or fire management activities may adversely affect areas of PCE 1a, the amount is expected to be low overall. A maximum of 34,205 acres of lynx critical habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 2,260 acres of lynx critical habitat could be treated using the exceptions for activities for other resource benefit. The acres of lynx critical habitat that could be treated are not likely all providing PCE 1a at the same time, if ever, but could potentially provide it at some point over the life of the CG Plan. Thus, as previously described, the total treatment of 36,465 acres of PCE 1a is not likely to occur. Although unlikely, the worst case scenario of treating approximately 36,465 acres of PCE 1a over the life of the CG Plan is considered for the purpose of this effects analysis.
- The amount of PCE 1a that may be treated under the exemptions to and/or exceptions from the NRLMD vegetation standards is approximately 6 percent of the critical habitat on the Forest.
- It is important to note that mapped lynx habitat consists of a mosaic of various forest structural stages and not all mapped lynx habitat is providing PCE 1a at the same

time. However, at a programmatic scale such as this, it is not possible to accurately map PCE 1a at every point in time for the life of the programmatic. Forest structural stages change over time and what is providing PCE 1a today may not be at some point in the future and what is not providing PCE 1a today may provide such in the future. In addition, PCE 1a that may be treated is likely to provide PCE 1a again, over time. Thus, we are analyzing the maximum amount that could be treated to be sure we do not overlook any potential effect.

- The CG Plan is a framework programmatic action and does not authorize, fund, or carry out an action but provides direction for future actions that may be authorized, funded, or carried out by the Forest. Since no site-specific projects are planned at this time, it is difficult to predict what may be proposed and what effects such projects may have. Therefore, any action subsequently authorized, funded, or carried out under the CG Plan will be addressed in subsequent section 7 consultations, as appropriate. Future site-specific consultations on projects will provide both the amount of PCE 1a within the action area LAU(s) and the amount of PCE 1a affected by the action, thus, analyzing the specific amount of PCE 1a that will be affected. We expect that such an analysis will likely reveal that much of the treatments will not occur within snowshoe hare habitat.
- The nature of most vegetation management alteration is temporary and reversible (i.e. forests regrow or can be restored). While project-related activities may adversely affect PCE 1a, effects would be temporary and no permanent loss of the inherent capacity of treated stands to provide lynx habitat is expected. The habitat would retain its inherent capacity to regenerate. Some vegetative treatments may degrade the function of PCE 1a by delaying the development of high density snowshoe hare habitat. While such actions may change the successional stage of a stand, they do not affect that stand's potential to produce snowshoe hare habitat in the future.
- Acres of PCE 1a treated are expected to be distributed throughout the action area and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs. Thus, adverse effects, while possible, are likely to affect only portions of any individual lynx home range. Any affected LAUs are expected to remain capable of producing adequate densities of snowshoe hares to support lynx presence.
- Further, many WUI areas occur at lower elevation (i.e. near the lower edge of lynx habitat) and are less likely to be the highest quality lynx habitat, which may reduce the potential overall effect.
- The potential adverse effects to lynx critical habitat due to the exemptions for fuel treatment projects in the WUI and exceptions for activities for other resource benefit are offset by the beneficial effects of the NRLMD. Monitoring and recording of actions are required as decisions are signed to ensure that the number of acres of PCE 1a treated through the exemptions and exceptions do not exceed the amounts described here.

- We do not anticipate adverse effects to the PCE as a result of the vegetation and fire management in stem exclusion stands (part of the PCE boreal forest) that do not provide snowshoe hare habitat.
- Moreover, for those areas that provide lynx critical habitat but not PCE 1a, we do not anticipate vegetation and fire management under the CG Plan to result in adverse effects to the remaining PCE components, including PCE 1b (deep fluffy snow), PCE 1c (denning habitat), and PCE 1d (matrix habitat).
- With management under the CG Plan and NRLMD, LAUs are expected to continue to provide conditions that would be conducive to supporting lynx. Although some actions may adversely affect areas of critical habitat, the treatments are expected to have small to insignificant effects on Critical Habitat Unit 5 as a whole. The entire action area (1,434,687 acres) is approximately 25 percent of the entire critical habitat Unit 5, which is approximately 9,146 square miles or 5,853,440 acres. The adverse effects of treating up to 36,465 acres of PCE 1a under the CG Plan would occur on a very small portion of Critical Habitat Unit 5, approximately 0.6 percent of critical habitat Unit 5. Thus, the impacts on critical habitat Unit 5 are very small and would not appreciably diminish the value of critical habitat for the conservation of lynx. The critical habitat is expected to remain capable of producing adequate densities of snowshoe hares to support continual lynx presence because overall, the CG Plan would maintain snowshoe hare habitat in adequate amounts to sustain snowshoe hare populations.
- The largest land owners within Critical Habitat Unit 5 are the Forest Service (Custer Gallatin, Shoshone, and Bridger-Teton National Forests). The Forests manage their land under the NRLMD or which has either been incorporated into their Forest Plans (Bridger-Teton) or has been amended to their Forest Plan (Shoshone). The NRLMD in these Forest Plans and/or amendments have previously undergone section 7 consultation and these Forests may also conduct actions that may adversely affect PCE 1a using exemptions from, and exceptions to, the vegetation management standards in their Forest Plans. While these other National Forests and may also conduct actions that may adversely affect PCE 1a, it was determined by the Service that such effects are not likely to result in the destruction or adverse modification of designated Canada lynx critical habitat. With all Forests with critical habitat in Unit 5 combined, 158,864 acres of critical habitat in Unit 5 may be adversely affected, which is approximately 2.7 percent of all critical habitat in Unit 5 (U.S. Fish and Wildlife Service 2017).
- Thus, the impacts on Critical Habitat Unit 5 is relatively small and would not appreciably diminish the value of critical habitat within the Unit for the conservation of lynx. Thus scaling up to all Critical Habitat Units, the CG Plan would not appreciably diminish the value of critical habitat across all units.
- Therefore, while vegetation and fire management projects under the CG Plan may adversely affect PCE 1a, the limited amount of PCE 1a that could be treated is not likely

to result in an appreciable reduction in the conservation value of critical habitat for the lynx DPS. Critical habitat in the action area would continue to provide a prey base and foraging habitat for a breeding population of lynx and connectivity for lynx movement within home ranges, and dispersal, serving its role in the conservation of lynx. The Service views 'conservation' as the process used to achieve recovery. The NRLMD vegetation objectives, standards, and guidelines would contribute to sustaining and growing snowshoe hare and lynx populations within lynx critical habitat in the action area and the CG Plan would not appreciably diminish the value of lynx critical habitat for the conservation and recovery of lynx.

- Other than vegetation and fire management, the many other activities that may be authorized under the CG Plan are not expected to have significant impacts on lynx critical habitat.
- Although unlikely, any other site-specific projects types that may adversely affect lynx critical habitat are constrained by other standards such as mandating maintenance of connectivity and would likely only affect a relatively small proportion of lynx habitat within the action area. Such actions would undergo site-specific consultation to determine such effects.
- A large proportion of lynx critical habitat in the action area occurs on lands that cannot be developed (i.e. wilderness), where management focuses on the maintenance of natural ecological processes, or conservation of rare ecological settings or components.
- By following the NRLMD, the CG Plan is expected to maintain habitat connectivity within critical habitat in any given LAU and/or linkage area. We do not expect habitat connectivity or linkage to be adversely affected from vegetation or fire management projects conducted under the CG Plan. While vegetation treatments could alter structural stages of potential lynx habitat, they are not likely to result in the construction of any barriers known to inhibit lynx movements. Site-specific projects are not likely to impede lynx movement or reduce habitat connectivity. Treatments proposed under the CG Plan are not expected to preclude any future use of an area by a resident lynx (if present) or a transient lynx should they pass through the area.

Forest lands in the action area LAUs are expected to provide conditions that would continue to be conducive to supporting lynx over the life of the CG Plan. We conclude that the adverse effects of the CG Plan on PCE 1a are limited in severity and in scale to the extent that critical habitat would continue to produce adequate densities of snowshoe hares and adequate levels of cover to support persistent lynx populations across the action area. We conclude that the proposed action will not alter the physical or biological features of critical habitat to an extent that appreciably diminishes the value of critical habitat for the conservation of lynx. The alterations will not preclude or significantly delay development of such features. The critical habitat units would retain their current ability for the primary constituent element to be

functionally established. Therefore, the proposed action is not likely to result in the destruction or adverse modification of designated Canada lynx critical habitat.

II.C. INCIDENTAL TAKE STATEMENT FOR CANADA LYNX

Section 9 of the Act, and Federal regulations pursuant to section 4(d) of the Act, prohibit the take of endangered and threatened species, respectively without special exemption. *Take* is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. *Harm* is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering. *Harass* is defined by the Service as an intentional or negligent act or omission that creates the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. *Incidental take* is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The CG Plan is a framework programmatic action, i.e. it provides direction for future actions that may be authorized, funded, and/or carried out by the Forest and it does not in itself mandate or approve future implementation of activities on the Forest. For the purposes of an incidental take statement, a Federal action is a framework programmatic action if it approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time, and any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further section 7 consultation. 50 C.F.R. § 402.02. For a framework programmatic action, an incidental take statement may be provided but is not required at the programmatic level; any incidental take resulting from any action subsequently authorized, funded, or carried out under the program that is not addressed below will be addressed in subsequent section 7 consultation, as appropriate.

For some activities implemented under the CG Plan, the level of detail available is insufficient to identify with particularity all possible circumstances that may possibly involve the incidental take of listed species. Given the lack of site-specific specificity and information regarding future effects of actions implemented under the CG Plan, providing the amount or extent of take would be speculative and unlikely to provide an accurate and reliable trigger for reinitiation of consultation for some effects. Consequently, with the exception of incidental take related to grizzly bears and Canada lynx as described below, other potential for incidental take that we are unable to anticipate at this time is deferred to future consultation on individual projects. Any incidental take resulting from subsequent actions that proceed under the CG Plan will be subject to section 7 consultation, as appropriate. In addition, take that may occur due to illegal activities by private citizens within the action area is not exempted in this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the Forest so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest has a continuing duty to regulate the activity that is covered by this incidental take statement. If the Forest (1) fails to assume and implement the terms and conditions or (2) fails to require an applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Forest must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 C.F.R. § 402.14(i)(3)].

II.C.1. Amount or Extent of Take Anticipated

We anticipate that most of the incidental take associated with implementation of the CG Plan, including the NRLMD, would occur in snowshoe hare habitat within occupied lynx habitat when projects are conducted under the exemptions from and exceptions to the vegetation standards VEG S1, S2, S5 and S6. We have been provided with explicit estimates on the maximum number of acres of snowshoe hare habitat that could be impacted related to the exemptions from and/or exceptions to NRLMD vegetation standards, based on mapping methods described in the BA, and we are able to provide an incidental take statement related to the use of these exemptions and exceptions.

We anticipate incidental take in the form of harm, via the modification of snowshoe hare habitat (lynx foraging habitat) that may temporarily result in a decreased production and density of snowshoe hares, the primary prey of lynx. Snowshoe hare habitat would be affected through the treatment of the horizontal structure of natural forest successional phases. As detailed earlier in this biological opinion, snowshoe hare habitat quality may be temporarily degraded on up to 46,865 acres of snowshoe hare habitat using exemptions for WUI treatments and 2,260 acres for exceptions for other resource benefit. Thus the Forest may treat up to 49,125 acres of snowshoe hare habitat within occupied lynx habitat, temporarily decreasing the existing dense horizontal structure required by snowshoe hares for forage and cover and thus affecting lynx foraging. Such impacts may interfere with the normal behavior patterns of a lynx and could potentially result in adverse effects to an individual lynx that may use the area of treatment as part of its home range. The temporary decrease in prey base may translate to some low level of impairment of reproduction and feeding, during some years. Specifically, we anticipate that some adult female lynx within home ranges affected by such projects may fail to complete a pregnancy or would be less successful in finding adequate food resources needed to ensure maximum survival potential for kittens. Thus, we expect reproductive impairment and kitten survival to be impacted. Lynx habitat in the action area is expected to remain capable of producing adequate densities of snowshoe hares to support continual lynx presence because adequate amounts of snowshoe hare habitat to sustain hare populations would remain within the action area LAUs.

The amount of incidental take that may occur under the CG Plan would be minimized in several ways. The NRLMD will be incorporated into the CG Plan. By following and incorporating the

NRLMD, the CG Plan will conserve lynx habitat, including snowshoe hare habitat, throughout the majority of the action area.

While some amount of vegetation and/or fire management activities may adversely affect areas of snowshoe hare habitat using the exemptions from and exceptions to the NRLMD standards, the amount is expected to be low overall. Although unlikely, the worst case scenario of treating approximately 49,125 acres of snowshoe hare habitat within occupied lynx habitat over the life of the CG Plan is considered for the purpose of this incidental take statement. Acres of snowshoe hare habitat treated are expected to be distributed throughout the action area and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs. Thus, adverse effects, while possible, are likely to affect only portions of any individual lynx home range. Any affected LAUs are expected to remain capable of producing adequate densities of snowshoe hares to support lynx presence. The nature of most vegetation management alteration is temporary and reversible (i.e. forests regrow or can be restored). While project-related activities may adversely affect snowshoe hare habitat, no permanent loss of the inherent capacity of treated stands to provide lynx habitat is expected. The habitat would retain its inherent capacity to regenerate. Some vegetative treatments may degrade the function of snowshoe hare habitat by delaying the development of high density snowshoe hare habitat through succession; however, they do not affect that stand's potential to produce snowshoe hare habitat in the future. Further, many WUI areas occur at lower elevation (i.e. near the lower edge of lynx habitat) and are less likely to be the highest quality lynx habitat, which may reduce the potential overall effect.

It is important to note that mapped lynx habitat consists of a mosaic of various forest structural stages and not all mapped lynx habitat is providing snowshoe hare habitat at the same time. However, at a programmatic scale such as this CG Plan, it is not possible to accurately map snowshoe hare habitat at every point in time for the life of the programmatic. Forest structural stages change over time and what is providing snowshoe hare habitat today may not be at some point in the future and what is not providing snowshoe hare habitat today may provide such in the future. The CG Plan is a framework programmatic action and does not authorize, fund, or carry out an action but provides direction for future actions that may be authorized, funded, or carried out by the Forest. Since no site-specific projects are planned at this time, it is difficult to predict what may be proposed and what effects such projects may have. Therefore, any action subsequently authorized, funded, or carried out under the CG Plan using the exemptions to and/or exceptions from the vegetation standards will be addressed in subsequent tiered section 7 consultations, as appropriate.

The incidental take we anticipate would be harm to only a very low number of lynx that may inhabit the area impacted. We do not expect all lynx that may occur in the action area to suffer disruptions in normal breeding or feeding patterns, nor would we expect permanent effects. The effects of potential treatment of snowshoe hare habitat on individual lynx are difficult to quantify. The best scientific and commercial data available at this time are not sufficient to enable the Service to determine a specific amount of incidental take of Canada lynx. The amount of take is difficult to quantify for the following reasons:

- Lynx are wide-ranging, not easily detected in the wild.
- Although we have a general understanding of where lynx population centers are, the distribution of individual lynx within the action area is not known.
- Although we have a general understanding that snowshoe hares occur and are widely distributed in lynx habitat across the action area, snowshoe hare densities across the action area are not known.
- We lack information to accurately predict the number of snowshoe hares and alternate prey needed for the survival of adult lynx or kittens.
- Snowshoe hare populations exhibit population cycles in Canada and although not well understood, populations likely fluctuate in the United States as well. This variation could cloud our ability to demonstrate a direct cause and effect relationship. It may be difficult in many cases to determine whether mortality or injury of lynx is attributable to incidental take of lynx as a result of the proposed action, or whether it was natural mortality or injury of lynx due to natural declines in snowshoe hares.
- We lack information to predict with precision the densities of hares in various habitat and forest stands, before and after specific treatments, especially in relationship to the host of naturally occurring environmental variables that may affect hare densities.
- Discovery or detection of lynx injury or mortality attributed to habitat alteration is very unlikely.

All of these variables are difficult to monitor or census. Thus, it is not practical to express the amount of anticipated take or to monitor take related impacts in terms of individual lynx. According to Service regulations implementing the Act (50 C.F.R. § 402.14(i)(1)(i)) and as stated in the Endangered Species Consultation Handbook (March 1998) (Handbook), some detectable measure of effect should be provided, such as the relative occurrence of the species or a surrogate species in the local community, or amount of habitat used by the species, to serve as a measure for take. Take also may be expressed as a change in habitat characteristics affecting the species (Handbook, p 4-47 to 4-48). In instances where incidental take is difficult to quantify, the Service uses a surrogate measure of take.

Due to the difficulty of estimating the precise number of lynx that would experience incidental take in the manner described, we have developed a surrogate measure to estimate the amount of anticipated take. As lynx are highly dependent on specific habitat for survival (snowshoe hare habitat), the surrogate measure for the number of lynx harmed will be quantified using acres of snowshoe hare habitat within occupied lynx habitat that may be treated under the CG Plan using the exemptions from and/or exceptions to the vegetation standards of the NRLMD. The Forest has provided explicit estimates on the number of acres of snowshoe hare habitat that will be impacted within occupied lynx habitat by fuels treatment projects within the WUI and/or precommercial thinning projects for other resource benefit. Thus, the incidental take statement sets a clear standard for determining when the amount or extent of the taking has been exceeded. Snowshoe hare habitat quality could be temporarily degraded on approximately 49,125 acres of snowshoe hare habitat within occupied lynx habitat using the exemptions from and exceptions to the NRLMD vegetation standards, decreasing the existing dense horizontal structure required by

snowshoe hares for forage and cover and thus affecting lynx foraging. This acreage represents our **surrogate measure of the incidental take of Canada lynx** that we anticipate as a result of the CG Plan.

Because the exemptions and exceptions are limited to a total of no more than about 6 percent of occupied lynx habitat on the Forest, the decrease in prey base would translate to some low level of impairment of reproduction and feeding, during some years. Specifically, we anticipate that some adult female lynx within home ranges affected by such projects may fail to complete a pregnancy or would be less successful in finding adequate food resources needed to ensure maximum survival potential for kittens. Thus, we expect reproductive impairment and kitten survival to be impacted.

Thus, as described in our surrogate measure above, if more than 49,125 acres of snowshoe hare habitat within occupied lynx habitat are treated over the life of the CG Plan using the exemptions from and exceptions to the NRLMD vegetation standards, then the level of incidental take we anticipated in this biological opinion would be exceeded and therefore the level of take exempted would be exceeded. Under CFR 402.16 (1), in this scenario, reinitiation of consultation would be required. Likewise, should the Forest choose in the future to re-model potential lynx habitat or adopt a new model for identifying lynx habitat other than what was described in the BA, the Forest should contact the Service to determine whether the new methods represent new information that would trigger the need to reinitiate consultation on the Plan.

II.C.2. Effect of the take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species. The amount of incidental take described above is low. The Service considers the retention of high quality snowshoe hare habitat in core area as most essential to lynx conservation. The effects of treatments are temporary and no permanent loss of the inherent capacity of treated stands to provide lynx habitat is expected. The vegetation standards would be applied across all occupied lynx habitat on the Forest. Up to 6 percent may be temporarily affected by treatments using exemptions or exceptions to vegetation standards, but at least 94 percent of lynx habitat is expected to remain capable of producing adequate densities of snowshoe hares to support continual lynx presence because snowshoe hare habitat would be left in adequate amounts to sustain hare populations throughout the action area. Also, even in areas treated through exemptions from and exceptions to the vegetation standards, the level of effects to the snowshoe hare prey base will vary depending upon site conditions and proposed treatments, and would not always result in adverse effects or incidental take of lynx. The impacts to lynx will occur on a very small portion of occupied lynx habitat and will not appreciably reduce survival or the recovery of the species.

II.C.3. Reasonable and Prudent Measures

Biological opinions provide reasonable and prudent measures that are expected to reduce the amount of incidental take. Reasonable and prudent measures are those measures necessary and appropriate to minimize incidental take resulting from proposed actions. Reasonable and prudent measures are nondiscretionary and must be implemented by the agency in order for the exemption in section 7(o)(2) to apply. The Service believes that the CG Plan reduces the potential for and minimizes the effect of incidental take of Canada lynx. By following the NRLMD, the CG Plan will also reduce the potential for incidental take of Canada lynx. As the Forest has incorporated the Service's previous terms and conditions associated with the NRLMD into CG Plan through Standard FW-STD-WLLX 02¹, no additional reasonable and prudent measures are necessary to minimize the impacts of incidental take of Canada lynx.

II.C.4. Reporting requirements

To demonstrate that the CG Plan is adequately reducing the potential for and minimizing the effect of any incidental take that may result, the Forest shall complete a report with the information listed below for Canada lynx and submit it to the Service's Montana Ecological Services Office biennially by May 1 for the preceding two calendar years for the life of the CG Plan. The report shall include:

1. In relation to the surrogate measure of incidental take of Canada lynx, an up-to-date record of the total amount of snowshoe hare habitat treated within occupied lynx habitat using the exemptions from and exceptions to the NRLMD vegetation standards.
2. To gauge the validity of our assumptions that the acres of snowshoe hare habitat treated are expected to be distributed throughout the action area and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs, provide a map spatially displaying project locations and acres of snowshoe hare habitat impacted in relation to LAU boundaries.
3. Reporting requirements 1 and 2 shall also be reported by the Forest at the time of section 7 consultation on site-specific projects for the project action area. This requirement ensures that projects do not treat more than the amounts described in the proposed action and this incidental take statement.

II.C.5. Closing Statement

The Service is unable to precisely quantify the number of Canada lynx that will be incidentally taken as a result of the CG Plan. Therefore, we use surrogate measures for the amount of incidental take we anticipate. We use the maximum amount of snowshoe hare habitat that could be treated in occupied lynx habitat using the exemptions from and/or exceptions to the NRLMD vegetation standards as our surrogate measure of incidental take of Canada lynx.

If, during the course of the action, the level of take occurring exceeds that anticipated in this incidental take statement, such incidental take represents new information requiring reinitiation of consultation and review of the incidental take statement. The Forest must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

II.C.6. Conservation Recommendations

Sections 7(a)(1) of the Act directs federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for the species.

1. Winter is the most constraining season for lynx and snowshoe hares. Dense horizontal cover of conifers above the snow level is critical to support snowshoe hares in winter. Vegetation management should be designed to provide for winter snowshoe hare habitat as forest stands develop successionally over time.
2. Provide a mosaic of lynx habitat that includes dense early-successional coniferous and mixed-coniferous-deciduous stands, along with a component of mature multi-story coniferous stands to produce the desired snowshoe hare density within each LAU.
3. Use fire and mechanical vegetation treatments as tools to maintain a mosaic of lynx habitat, in varying successional stages, distributed across the LAU in a landscape pattern that is consistent with historical disturbance processes.
4. Provide for continuing availability of lynx foraging habitat (snowshoe hare habitat) in proximity to denning habitat and retain patches of untreated areas of dense horizontal cover within treated areas where possible.
5. The Forest Service should continue to monitor the amount and condition of lynx habitat in unoccupied secondary habitat, as recommended in the lynx recovery outline. This information would be useful in future assessments of the value of secondary area to lynx.
6. The Forest Service should ensure to the extent possible, that unoccupied habitat continues to facilitate and allow dispersal of transient lynx into the future. Therefore in linkage zones in unoccupied lynx habitat or for projects that may affect such linkage zones, apply the following direction from the NRLMD:
 - Maintain or restore lynx habitat connectivity in linkage areas (All O1).
 - New or expanded permanent developments and vegetation management projects must maintain habitat connectivity in linkage areas (All S1).
 - Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal lands (All G1)

- 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 (LINK O1).
- When highway or forest highway construction or reconstruction is proposed in linkage areas, identify potential highway crossings (LINK S1).
- National Forest Service lands should be retained in public ownership (LINK G1).

II.C.7. Reinitiation Notice

This concludes consultation on the effects of the CG Plan on Canada lynx, and lynx critical habitat. As provided in 50 C.F.R. § 402.16, reinitiation of consultation is required and shall be requested by the federal agency or by the Service where discretionary federal involvement or control over the action has been retained or is authorized by law and: (1) if the amount or extent of taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) if a new species is listed or critical habitat designated that may be affected by the identified action.

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Chapter III: GRIZZLY BEAR

III.A. BIOLOGICAL OPINION FOR GRIZZLY BEAR

This chapter provides the biological opinion for the threatened grizzly bear (*Ursus arctos horribilis*). Section 7(b)(3)(A) of the Endangered Species Act of 1973, as amended (Act) requires that the Secretary of Interior issue biological opinions on federal agency actions that may adversely affect listed species or critical habitat. This document includes: (1) the opinion of the U. S. Fish and Wildlife Service as to whether or not the Federal action is likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of designated critical habitat; (2) a summary of the information on which the opinion is based; and (3) a detailed discussion of the effects of the action on listed species or designated critical habitat. [50 CFR §402.02, 50 CFR §402.14(h)]. The U.S. Fish and Wildlife Service (Service) based this opinion on our review of the biological assessment (BA) prepared for the Custer Gallatin National Forest (CG Forest) revised Land and Resource Management Plan (CG Plan), additional information provided during consultation, and information in our files.

This consultation represents the first tier of a tiered consultation framework. Each subsequent project that may affect the listed species and/or designated critical habitat analyzed within this programmatic biological opinion, as implemented under the CG Plan, is the second tier of consultation. When applicable, some second tier consultations would reference back to this programmatic biological opinion to ensure that the effects of specific projects under consultation are commensurate with the effects anticipated in this biological opinion and incidental take statement.

Throughout this grizzly bear chapter, the term “Gallatin Forest” refers to the portion of the combined Custer Gallatin National Forest previously considered the Gallatin National Forest, and the term “Custer Forest” refers to the Custer National Forest portion of the combined Custer Gallatin National Forest.

Action Area for Grizzly Bears

Although the Service has not explicitly defined ecosystem boundaries relative to grizzly bears, ecosystems are generally considered to be the larger area surrounding defined recovery zones in which grizzly bears may be anticipated to occur as part of the same population (U.S. Fish and Wildlife Service 2021 [the SSA], p.56). The 1993 Recovery Plan and succeeding supplements identified recovery zones at the core of each of the six ecosystems to further recovery efforts (SSA, page 56 - U.S. Fish and Wildlife Service 1993, 1996, 1997, 2000). Each recovery zone represents an area large enough and of sufficient habitat quality to support a recovered grizzly bear population (U.S. Fish and Wildlife Service 1993, p. 17). The 1993 Recovery Plan recognized that grizzly bears would move and reside permanently in areas outside the recovery zones but only the area within the recovery zone is managed primarily for grizzly bear habitat (U.S. Fish and Wildlife Service 1993, p. 18).

The Greater Yellowstone Ecosystem (GYE, synonymous with the Greater Yellowstone Area (GYA)) is located in northwest Wyoming, eastern Idaho, and southwestern Montana and refers to the larger ecological system containing and surrounding Yellowstone National Park (YNP).

The GYE includes portions of the CG Forest, four other National Forests, YNP, Grand Teton National Park, the John D. Rockefeller Memorial Parkway, and State, Tribal, and private lands. The GYE is generally defined as those lands surrounding YNP with elevations greater than 1,500 meters (4,900 feet) (U.S. Forest Service 2004, p. 46; Schwartz et al. 2006, p. 9). Plant communities in the GYE vary from grasslands at lower elevations (less than 1,900 meters (6,230 feet)) to conifer forests at mid-elevations and subalpine and alpine meadows at higher elevations (greater than 2,400 meters (7,870 feet)).

Within the GYE are the recovery zone and the Demographic Monitoring Area (DMA; **Error! Reference source not found.**). The DMA is the area in which the population is annually estimated, and which mortality limits apply for the GYE. It is defined by suitable habitat plus potential sink areas (i.e., linear areas along valley floors where human influence could have disproportionate effects and death rates exceed birth rates). Suitable habitat contained within the DMA is sufficiently large to support a viable population in the long term. Throughout this biological opinion, the terms “recovery zone” and “DMA” refer specifically to the grizzly bear recovery zone and DMA for the Greater Yellowstone Ecosystem identified in Figure III 1.

Over 11 million acres of suitable habitat has been identified for grizzly bears in the GYE. Of that, about 6 million acres is inside the recovery zone (Yellowstone Ecosystem Subcommittee 2016). The CG Forest administers approximately 19 percent (over 2 million acres) of the total suitable habitat, and roughly 16 percent (nearly 1 million acres) of the area within the recovery zone for grizzly bears in the GYE.

Chapter 1 defined “action area” under the Act and identified the action area for the entire area covered by the CG Plan (**Figure I-1**). For analyzing effects to grizzly bears in this biological opinion, the grizzly bear action area is defined by the four Geographic Areas (GA) on the CG Forest located within or adjacent to the GYE. Note the “grizzly bear action area” throughout the remainder of this biological opinion will be referred to as “action area” for convenience. This action area includes the Madison, Henrys Lake and Gallatin Mountains Geographic Area (MHG), Absaroka Beartooth Mountains Geographic Area (AB), Bridger, Bangtail and Crazy Mountains Geographic Area (BBC), and Pryor Mountains Geographic Area (PM) (**Error! Reference source not found.**).

The Pryor Mountains Geographic Area and the Bridger, Bangtail and Crazy Mountains Geographic Areas are outside the area the Service currently considers grizzly bears as “may be present” for consultation under Section 7(a) of the Act. Consultation on projects in these GAs is outside the areas where the Service considers grizzly bears as “may be present” and therefore not required. As grizzly bears expand their range, the Service has developed methodology to define and update areas they are currently considered as “may be present”. The methodology is derived from current distributions and verified locations outside of current distribution data; not all areas that are designated as “may be present” meet the criteria to be included in the current distribution for grizzly bears. The Service updates the maps annually, and the current year’s map is available on the FWS grizzly bear website (see project record for 2021 map and methodology). Because grizzly bear range is expanding dynamically, the Pryor Mountains (PM) Geographic Area and the Bridger, Bangtail and Crazy Mountains (BBCM) Geographic Area are included in the action area for this consultation in the event grizzly bears be considered as “may be present” during the

life of the CG Plan. The Service anticipates the CG Plan may affect grizzly bears if or when grizzly bears may be present in the PM and BBCM Geographic Areas.

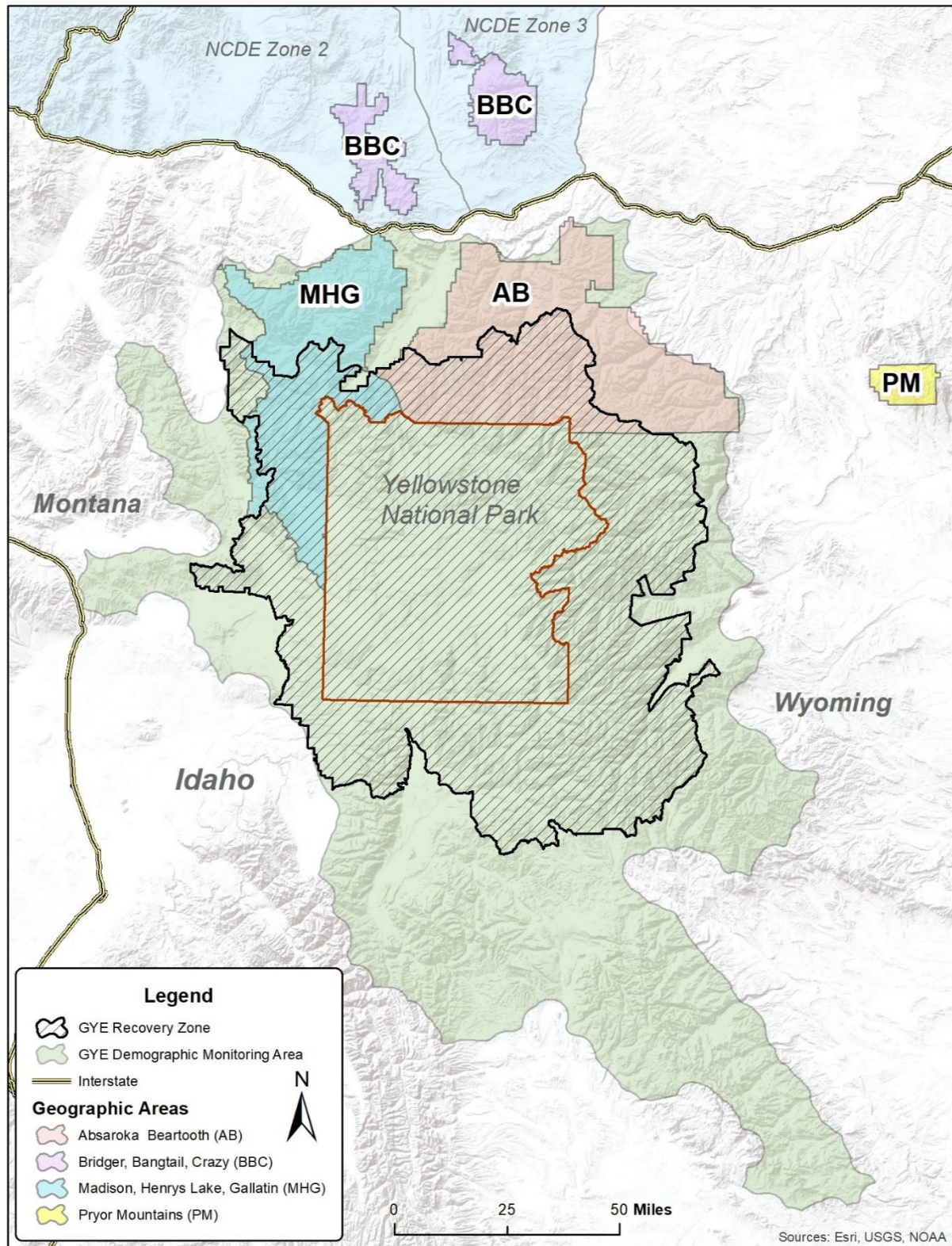


Figure III-1. Geographic Areas of the CG Forest forming the grizzly bear action area, GYE recovery zone, and GYE Demographic Monitoring Area (DMA).

1. MHG and AB Geographic Areas

Large portions of these two geographic areas are within the recovery zone and except for small areas along their northern boundaries, they are entirely within the DMA (Figure III-1). Grizzly bears are considered as “may be present” throughout these GAs.

2. BBC Geographic Area

The BBC GA consists of two island mountain ranges: the Bridger/Bangtail Mountains and the Crazy Mountains. Both of these mountain ranges are considered part of the Northern Continental Divide Ecosystem (NCDE; **Error! Reference source not found.**). The Bridger/Bangtail Mountains are located in Zone 2 of the NCDE where management intent is to provide the opportunity for movement between the GYE and NCDE. The Crazy Mountains are located in Zone 3 of the NCDE, which is not considered important for providing habitat linkage to other grizzly bear ecosystems. The focus of grizzly bear management in Zone 3 is conflict prevention and quick response to human-grizzly bear conflicts. The Bridger/Bangtail Mountains and the Crazy Mountains are currently outside the area the Service considers grizzly bears as “may be present”.

3. PM Geographic Area

The PM GA is an island mountain range to the east of the GYE (**Error! Reference source not found.**). Although it is outside the GYE, NCDE, DMA, and the area grizzly bears “may be present”, the PM GA is part of the action area due to the presences of suitable grizzly bear habitat and proximity to the current distribution of grizzly bears.

Aspects of the Proposed Action Important to Grizzly Bears

As described in Chapter 1, the CG Plan is a framework programmatic action containing distinct plan elements to guide day-to-day resource management options. The CG Plan replaces the 1986 Gallatin National Forest Plan (as amended in 2015) and the 1986 Custer National Forest Plan. This biological opinion supersedes the following previously issued biological opinions on the Gallatin National Forest:

- The 2015 Forest Plan amendment (U.S. Fish and Wildlife Service 2015) that incorporated management direction from the 2007 GYE Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area (Yellowstone Ecosystem Subcommittee 2007) into the Gallatin Forest Plan. The 2015 amendment superseded the 1986 biological opinion on the Forest Plan (U.S. Fish and Wildlife Service 1986) as amended in 1995 (U.S. Fish and Wildlife Service 1995), and the 2004 biological opinion (U.S. Fish and Wildlife Service 2004) on effects to food storage and livestock grazing.

There are no existing biological opinions on effects to grizzly bears for the Custer National Forest portion of the Custer Gallatin National Forest. The Beartooth Ranger District is the only portion of the Custer Forest where grizzly bears currently may be present. Approximately 98.6 percent of the 114,000 acres in the Beartooth Ranger District that are within the Yellowstone Grizzly Bear Recovery Zone (recovery zone) are designated wilderness or in a management area

that emphasizes wildlife habitat protection and discourages permanent road construction (U.S. Forest Service 2006).

In a letter dated May 19, 1986, the Service determined that the 1987 Custer National Forest Plan would not jeopardize the continued existence of the grizzly bear (U.S. Fish and Wildlife Service 1986). The Custer National Forest did not consult with the Service on their Forest Plan subsequent to the June 3, 1986 publication of revisions to the Act requiring an analysis of incidental take or ensuing changes in management strategy for grizzly bears.

Plan components in the CG Plan addressing grizzly bears were generally adopted from the most current version (Yellowstone Ecosystem Subcommittee 2016) or proposed revisions to the Conservation Strategy (Tech Team 2019). Status and source of CG Plan components are identified in the analysis of effects. Those specifically incorporated to address grizzly bears (alphanumeric prefix of *WLGB*) and other components incorporated under other resource management categories that would affect bears (e.g., general wildlife standards and food storage) can be viewed in the most current version of the revised CG Plan.

III.A.1 Status of the Species

a. Range-wide Status, Distribution, and Life History

For information on the status of grizzly bears, including species description, life history, and range-wide status and distribution, refer to the Grizzly Bear Recovery Plan (U.S. Fish and Wildlife Service 1993), the Species Status Assessment for the Grizzly Bear (SSA; U.S. Fish and Wildlife Service 2021), Grizzly Bear 5-Year Review (U.S. Fish and Wildlife Service 2021a), the grizzly bear recovery program 2020 annual report (U.S. Fish and Wildlife Service 2021b), the NCDE Grizzly Bear conservation strategy (NCDE Subcommittee 2020), Grizzly bear demographics in the NCDE (Costello et al. 2016), NCDE grizzly bear population monitoring team annual report 2020 (Costello and Roberts 2021), the Greater Yellowstone Ecosystem Conservation Strategy (Yellowstone Ecosystem Subcommittee 2016), the Yellowstone Grizzly Bear Investigations 2018 (van Manen et al. 2019), the interagency grizzly bear study team 2019 annual report summary (IGBST 2020), the Cabinet-Yaak Grizzly Bear Recovery Area 2020 Research and Monitoring Progress Report (Kasworm et al. 2021), Density, distribution, and genetic structure of grizzly bears in the Cabinet-Yaak Ecosystem (Kendall et al. 2016), and the Selkirk Mountains Grizzly Bear Recovery Area 2020 Research and Monitoring Progress Report (Kasworm et al. 2021a). These documents include the best available science regarding the life history, population dynamics, status and distribution of grizzly bears and are incorporated by reference.

The SSA used the best available scientific information to characterize the viability of grizzly bears for the next 30-45 years in the contiguous United States. The SSA determined viability for the grizzly bear improves slightly if conservation efforts continue at their current rate and levels of effectiveness. If conservation efforts decline, viability also decreases and if conservation efforts increase, viability improves (U.S. Fish and Wildlife Service 2021, p. 245). In the 5-year review (U.S. Fish and Wildlife Service 2021a), and in consideration of the best available scientific and commercial information (U.S. Fish and Wildlife Service 2021), the Service determined that the grizzly bear in the lower-48 States does not meet the definition of an endangered species, but does meet the definition of a threatened species in accordance with Section 3(6) and 3(20) of the Act.

b. Critical Habitat

There is no critical habitat designated for grizzly bears. The Service proposed to designate critical habitat for grizzly bears in 1976, but the designation was rendered obsolete by the 1978 critical habitat amendments to the Act and the proposal was never finalized. Recognizing the importance of habitat to the species, the Interagency Grizzly Bear Committee (IGBC) alternately issued habitat management guidelines within all occupied grizzly bear habitat. These habitat guidelines are considered to be one of the primary factors in successful GYE grizzly recovery efforts.

c. Population Status in the GYE and CG Forest

The GYE grizzly bear population met demographic recovery targets by 1998 and has generally met or exceeded most recovery targets since then (Yellowstone Ecosystem Subcommittee 2016). With no evidence of a population decline, but rather a slowing of the rate of population growth in recent years, it may be that the GYE grizzly bear population is nearing carrying capacity (IGBST 2013, pg. 35). In 2020, the model-averaged Chao2 estimate was 57 females with cubs within the DMA, from which a derived a total population estimate of 727 with a 95% confidence interval of 648 to 806 bears (van Manen et al. 2021, p. 1). The number of bears specifically occurring in the Custer Gallatin National Forest action area, both within and outside the Recovery Zone, is not known but would be expected to be following the same trend as for the entire GYE.

d. Listing Status and Management Direction in the GYE

Listing Status

The Service published the rule to designate the grizzly bear as threatened in the conterminous (lower 48) United States on July 28, 1975 (U.S. Fish and Wildlife Service 1975, 40 FR 31734). Accordingly, the 1982 recovery plan was developed (U.S. Fish and Wildlife Service 1982) and updated as necessary (Recovery Plan; U.S. Fish and Wildlife Service 1993, 2007a, 2007b, 2017 other than 1975 rule and 1982 plan). The designation of the grizzly bear as a threatened species in the conterminous United States and development of the 1982 and 1993 Recovery Plans occurred before publication of the Distinct Population Segment (DPS) policy in 1996 (U.S. Fish and Wildlife Service 1996, 61 FR 4722). The 1993 Recovery Plan identifies distinct Recovery Zones and unique demographic parameters for six different grizzly bear populations with the intent that these individual populations would be delisted as they each achieve recovery (U.S. Fish and Wildlife Service 1993).

On March 29, 2007, the Service finalized the proposed action designating the Greater Yellowstone Ecosystem (GYE) population as a DPS and removed grizzly bears in the GYE from the Federal List of Endangered and Threatened Wildlife (U.S. Fish and Wildlife Service 2007, 72 FR 14866). Note: the terms Greater Yellowstone Area (GYA) and Greater Yellowstone Ecosystem (GYE) have been used interchangeably throughout the listing and refer to the same geographic area relative to grizzly bears. On September 21, 2009, the District Court of Montana vacated the final rule that designated GYE grizzly bears as a DPS and removed them from the list of threatened species. In accordance with the court order, in March of 2010, the Yellowstone grizzly population was once again listed as a threatened population under the Endangered Species Act (U.S. Fish and Wildlife Service 2010, 75 FR 14496).

After further analysis, the best available scientific and commercial data continued to indicate the GYE population of grizzly bears as a valid DPS and that this DPS has recovered and no longer meets the definition of an endangered or threatened species under the Act. On June 30, 2017, the

Service again published a final rule designating the GYE population as a DPS and removing grizzly bears in the GYE from the Federal List of Endangered and Threatened Wildlife (U.S. Fish and Wildlife Service 2017, 82 FR 30502). A district court ruling in 2018 vacated the 2017 rule. Currently, grizzly bears are considered threatened in the conterminous United States under the Act and GYE grizzly bears are not considered a DPS.

Existing Management Direction

The Recovery Plan guides management during the period grizzly bears are listed under the Act. When grizzly bears were delisted in 2007, in 2017, and for any future delistings, the Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Ecosystem (GYE Conservation Strategy; ICST 2003, 2007, 2016) is intended to be the document guiding management and monitoring of the GYE grizzly bear population and its habitat into the future. When grizzly bears are delisted, the GYE Conservation Strategy re-defines the recovery zone as the Primary Conservation Area (PCA) to reflect the paradigm shift from managing for recovery to one of conservation. Development of the GYE Conservation Strategy is directed by Task Y426 and Task Y53 in the Grizzly Bear Recovery Plan and is periodically updated to incorporate the best available scientific information. Upon delisting, the Yellowstone Grizzly Coordinating Committee replaces the Yellowstone Ecosystem Subcommittee (YES) and implements the GYE Conservation Strategy.

The key to establishing habitat criteria that will maintain a healthy population is to look at habitat factors in the past that produced a grizzly bear population in the GYE that is increasing in numbers and expanding in range (ICST 2007, p20). The GYE grizzly bear population was increasing at approximately 4-7 percent annually between 1983 and 2001 (Eberhardt et al. 1994, Boyce 1995, Boyce et al. 2001, Harris et al. 2006 – this from page 34 of 2007 CS). Information indicates that both the population and geographic area of occupancy were increasing (Schwartz et al. 2002 – page 34 of 2007 Conservation Strategy).

Habitat condition in 1998 were chosen as a meaningful baseline because they are believed to have supported and contributed to the population growth observed between 1983 and 2001 (2016 Yellowstone Ecosystem Subcommittee 2016, page 56). The 1998 baseline became the basis for the Conservation Strategy (Yellowstone Ecosystem Subcommittee 2003, 2007, 2016) for post-delisting management of grizzly bears that was subsequently incorporated into programmatic guidance by the Gallatin Forest and resulted in many of the existing baseline conditions. The focus of habitat management standards incorporated from the 2003 GYE Conservation Strategy into the 2006 Gallatin National Forest Travel Plan and the 2007 GYE Conservation Strategy incorporated into the 2015 Gallatin Forest Plan amendment are:

1. The number of developed sites within each BMU subunit of the recovery zone are maintained at 1998 levels, with some exceptions for administrative and maintenance needs.
2. Motorized access management to improve conditions above 1998 levels of secure habitat for three BMU-subunits on the Gallatin National Forest (Gallatin #3, Henrys Lake #2, and Madison #2) and maintain secure habitat at 1998 levels or above for all others in the recovery zone.
3. The number of commercial livestock allotments and number of permitted domestic sheep will not exceed 1998 levels inside the recovery zone.

Similar habitat management strategies were not incorporated into the Forest plan for the Custer Forest portion of the recovery zone or by the 2008 Beartooth Ranger District Travel Plan.

Subsequent to the 2016 GYE Conservation Strategy, the Developed Sites Technical Team (Tech Team) was established and tasked with addressing developed site standards in the Conservation Strategy. Their proposed revisions (Tech Team 2019) have not yet been formally adopted into the GYE Conservation Strategy.

Forest plan amendments and other decisions by the CG Forest have occurred under different revisions of the GYE Conservation Strategy as indicated in this document by the year preceding the referenced version; 2003 GYE Conservation Strategy refers to the original version developed in 2003, 2007 GYE Conservation Strategy refers to the 2007 revision and 2016 GYE Conservation Strategy refers to the 2016 revision.

III.A.2 Analysis of the Species Likely to be Affected

a. Analytical Framework for Jeopardy Determination

In accordance with policy and regulation, the jeopardy *analysis* in this biological opinion relies on four components:

1. The *Status of the Species*, which evaluates the grizzly bears range-wide condition, the factors responsible for that condition, and its survival and recovery needs.
2. The *Environmental Baseline*, which evaluates the condition of the grizzly bear in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of grizzly bears.
3. The *Effects of the Action*, which determines all consequences of the proposed federal action on grizzly bears.
4. *Cumulative Effects*, which evaluates the effects of future, non-federal activities reasonably certain to occur in the action area on grizzly bears.

In accordance with policy and regulation, the jeopardy *determination* is made by evaluating the effects of the proposed federal action in the context of the grizzly bear's current status, taken together with the environmental baseline and cumulative effects, to determine if implementation of the proposed action is likely to jeopardize the continued existence of grizzly bears.

Regulations for section 7 (50 CFR 402) define "jeopardize the continued existence of" as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." In the context for this determination, the Endangered Species Consultation Handbook (Handbook; U.S. Fish and Wildlife Service and National Marine Fisheries Service, 1998) defines "survival" and "recovery" as:

Survival - For determination of jeopardy/adverse modification: the species' persistence as listed or as a recovery unit, beyond the conditions leading to its endangerment, with sufficient resilience to allow for the potential recovery from endangerment. Said another way, survival is the condition in which a species continues to exist into the future while retaining the potential for recovery. This condition is characterized by a species with a

sufficient population, represented by all necessary age classes, genetic heterogeneity, and number of sexually mature individuals producing viable offspring, which exists in an environment providing all requirements for completion of the species' entire life cycle, including reproduction, sustenance, and shelter.

Recovery - Improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act (50 CFR 402.02).

The jeopardy analysis for grizzly bear in this biological opinion considers the relationship of the action area to the recovery unit and the relationship of the recovery unit to both the survival and recovery of the grizzly bear as a whole for evaluating the significance of effects of the proposed federal action, taken together with cumulative effects, for making the jeopardy determination.

b. Analysis Units

Bear Management Units (BMU): Land within the recovery zone was divided into 18 Bear Management Units (BMU) and 40 Subunits (BMU-subunits) to facilitate habitat management and ensure habitat was well distributed across the recovery zone (Figure III-2). BMUs are used to measure the distribution of females with young while BMU-subunits allow better resolution of habitat measurement (ICST 2017 page 22). The BMU-subunit represents the most energetically efficient area for a grizzly bear and is correlated to the annual home range size of an adult female grizzly bear in the ecosystem. Throughout the GYE, BMUs encompass lands administered by five National Forests and two National Parks. Of the 14 BMU subunits that fall within the Custer Gallatin boundary, only Boulder/Slough #1, is entirely within the CG Plan area; all others are shared with at least one other administrative unit.

Bear Analysis Units (BAU): Outside the recovery zone, bear analysis units (BAU) that are roughly the size of BMU-subunits (Schwartz et al. 2009) were developed to provide consistent analysis units for monitoring changes to grizzly bear habitat (Figure III-3). Boundaries of BAUs are tied to areas determined to be biologically suitable and socially acceptable for grizzly bear occupancy and coincide with areas the states are currently managing for grizzly bear populations or are considering for future management (van Manen et al. 2018, p.103). BAUs were originally defined and amended to Forests in 2006 and then modified by Schwartz et al. 2009, p. 70). Unlike BMUs, the BAUs on the CG Forest are wholly within the Forest boundary (i.e. not shared with other administrative units).

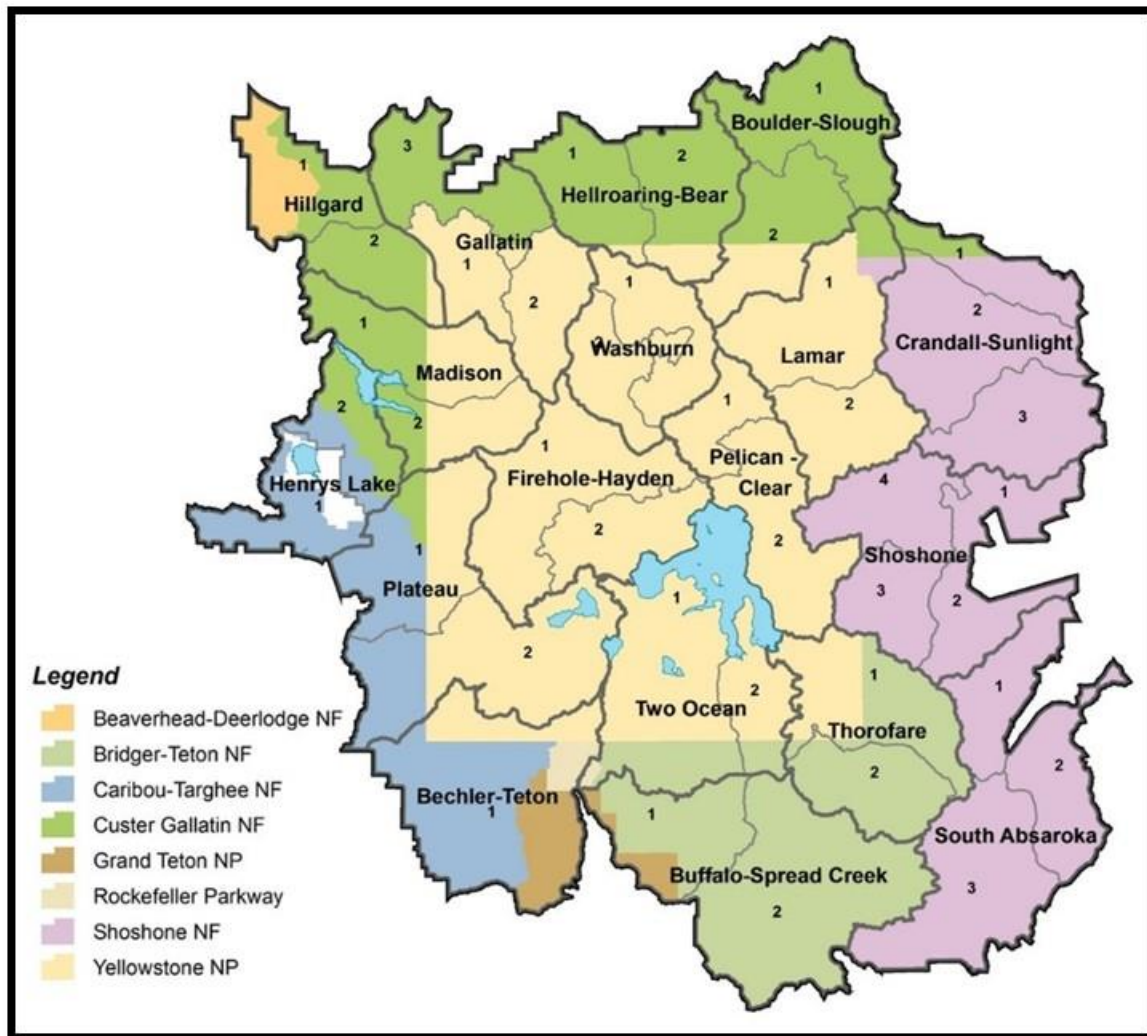


Figure III-2. Bear Management Units and Subunits inside the recovery zone of the GYE (from van Manen et al. 2019).

c. Analytical Framework for the Environmental Baseline and Effects of the Action

The Service developed the SSA Framework as a species-specific analytical approach to deliver foundational science for informing all Endangered Species Act decisions (U.S. Fish and Wildlife Service 2016). Based on how environmental factors are understood to act on the species and its habitat, step one of the three-part SSA Framework begins with a compilation of the best available biological information on the species, including its taxonomy, life history, habitat, and ecological needs at the individual, population, and species levels. The second part describes the current condition of the species’ habitat, demographics, and the probable explanations for past and ongoing changes in abundance and distribution, while the third part forecasts the species’ response to probable future scenarios. The SSA is designed to “follow the species” in the sense that the information on the biological status is available for conservation use and can be updated with new information. It provides a single source for information and decision making (U.S. Fish and Wildlife Service 2016, Smith et al. 2018).

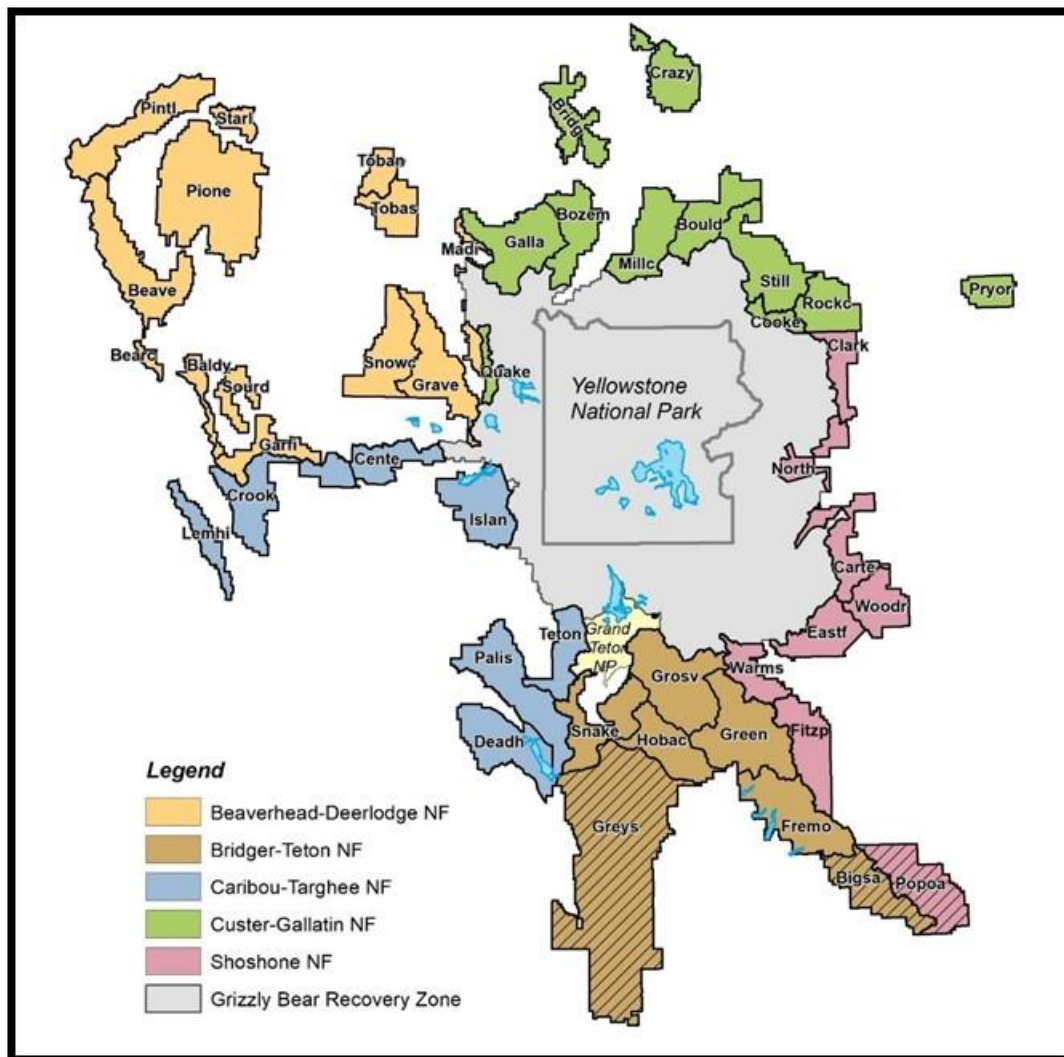


Figure III-3. Bear Analysis Units outside the recovery zone of the GYE (from van Manen et al. 2019).

Because an SSA provides the best available scientific information to guide Endangered Species Act decisions (U.S. Fish and Wildlife Service 2016), the grizzly bear SSA is referred to extensively throughout this biological opinion. The grizzly bear SSA addresses 15 stressors that result in a change in habitat or demographic resource and seven conservation efforts that either reduce a stressor or improve condition of habitat or demographics (page 99). This biological opinion addresses all 15 stressors and seven conservation efforts.

However, many of the stressors are interrelated and can overlap with other stressors when addressing management direction of the CG Plan. For example, the stressor “Motorized Access Management” is related to, and can overlap with, the stressors “Recreation” and “Activities Disturbing Dens” when addressing recreational use of all-terrain vehicles (ATV) and motorcycles in the summer and over-snow motorized vehicles (all over-the-snow motorized vehicles including snowmobiles and snow bikes are referred to as over-snow motorized vehicles) during the winter. Other stressors, such as “Development on Private Land” and “Conservation Easements and Land Trusts” are not under the direction of the CG Plan but may ultimately influence the status and viability of grizzly bears in the action area.

Habitat stressors identified in the SSA are also related to the three measurable habitat criteria appended to the grizzly bear recovery plan (U.S. Fish and Wildlife Service 2007 - supplement); “Secure Habitat”, “Livestock Allotments”, and “Developed Sites”. The habitat criteria Developed Sites from the recovery plan includes the SSA stressor Developed Recreation Sites, sites for administrative use, and permitted resource development such as oil and gas wells and plans of operation for mining activities on federal lands. Secure Habitat is calculated relative to the distance from motorized access routes and Livestock Allotments is the same as the SSA stressor by the same name other than motorized access routes associated with allotments. As described below, habitat recovery criteria were appended to the 1993 Recovery Plan with the overall goal of maintaining or improving habitat conditions at levels that existed in 1998 (U.S. Fish and Wildlife Service 2021).

Table III-1 provides a crosswalk of the 15 stressors and seven conservation efforts addressed in the SSA (left column) with the corresponding three habitat criteria identified in the recovery plan and section headings where they are incorporated and discussed in this biological opinion (right column). Where applicable, the stressors and conservation efforts are addressed in both the “Environmental Baseline” of this biological opinion to indicate existing conditions and the “Effects of the Action” section to identify changes over existing conditions and effects that the changes will have on grizzly bears.

Table III-1. Crosswalk between Stressors and Conservation Efforts addressed in the Species Status Assessment (SSA) and corresponding sections of this biological opinion.

<i>SSA Stressors</i>	<i>Biological Opinion Discussion Section</i>
Motorized Access Management	Motorized Access - all motorized access, including motorized routes for Recreation and motorized access related to other stressors as indicated below.
Developed Recreation Sites	*Developed Sites on Federal Land - all developed sites on federal land (recreational, administrative, mineral and energy development)
	*Secure Habitat - metric for assessing grizzly bear habitat incorporating motorized access routes.
Livestock Allotments	*Livestock Allotments - includes human-caused mortality specifically relating to the allotments.
Mineral and Energy Development	access routes are addressed under Motorized Access , sites themselves are addressed under Developed Sites on Federal Land
Recreation	Recreation - summer and winter non-motorized recreation
Vegetation Management	Vegetation Management - any associated roads are addressed in Motorized Access
Habitat Fragmentation Connectivity and Genetic Health	Habitat Fragmentation/Connectivity
Changes in Food Resources	Food Resources
Activities Disturbing Dens	Motorized Access and Recreation
Climate Change	only in Environmental Baseline
Development on Private Land Sources of Human-caused Mortality Natural Mortality Catastrophic Events	Cumulative Effects section
<i>SSA Conservation Efforts</i>	<i>Biological Opinion Discussion Section</i>
Federal Land Protection	Land Designation
Attractant Removal or Storage	Food and Attractant Storage
Information and Education Effective Law Enforcement	Information, Education, and Enforcement
Conservation Easements and Land Trusts Augmentation or Translocation	Cumulative Effects section
Motorized Access Restrictions on State and Private Lands	

* Indicates the 3 measurable habitat criteria identified in the grizzly bear recovery plan.

III.A.3 Environmental Baseline

Under the provisions of section 7(a)(2), when considering the “effects of the action” on listed species and designated critical habitat, the Service is required to consider the environmental baseline. Regulations implementing the Act (50 C.F.R. § 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in progress. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency’s discretion to modify are part of the environmental baseline.

This section describes current baseline conditions in the action area under the existing management direction as defined by the 15 stressors and 7 conservation efforts of the SSA and three measurable habitat criteria of the recovery plan. Organization of this section follows Table III-1. Information relative to the effects and influence of these metrics (stressors and conservation efforts) to grizzly bears is provided during discussion of the effects of the proposed action in section III.A.6. Effects of the Action.

a. Motorized Access

The environmental baseline for motorized access consider the status and designation of motorized access routes and off-route use by motorized wheeled vehicles during the non-denning season and over-the snow motorized vehicles during the denning season. Specific motorized access conditions defining the environmental baseline are provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

b. Developed Sites on Federal Land

The environmental baseline for developed sites on federal land considers the existing number and type of developed sites within the recovery zone. The number and type of developed sites on federal land within the boundary of the CG Forest for each BMU is provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

c. Secure Habitat

The environmental baseline for secure habitat is determined by a minimum distance from motorized access routes and size of the patches. The percentage of secure habitat for BMU-subunits within the recovery zone and BAU subunits outside the recovery zone is provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

d. Livestock Allotments

The environmental baseline for livestock allotments considers the number, acreage, and species grazed on livestock allotments in the recovery zone. Number, acreage, and species grazed within the recovery zone is provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

e. Recreation

The environmental baseline for recreation considers types and trends of non-motorized recreational use on the CG Forest. Types of non-motorized recreational use, trends in use, and current restrictions on recreation are provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

f. Vegetation Management

The environmental baseline for vegetation management considers the types of vegetation management activities and amount of land considered suitable for timber production. These aspects of vegetation management are provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

g. Habitat Fragmentation/Connectivity

The environmental baseline for habitat fragmentation/connectivity considers current conditions of habitat fragmentation and management direction facilitating connectivity between ecosystems. Aspects of habitat fragmentation/connectivity establishing the environmental baseline are provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

h. Food Resources

The environmental baseline for food resources considers the four foods with relatively high energetic value and for which abundance (or use by bears) is relatively easy to measure. Presence of these four food resources establishing the environmental baseline are provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

i. Land Designation

The environmental baseline for land designation considers federal lands with restrictions, such as motorized restrictions, designated wilderness, and Inventoried Roadless Areas (IRA). Acres and designation type for establishing the environmental baseline are provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

j. Food and Attractant Storage

The environmental baseline for food and attractant storage considers existing requirements for proper storage of food and other attractants to grizzly bears. Existing requirements establishing the environmental baseline are provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

k. Information, Education, and Enforcement

The environmental baseline for information, education, and enforcement considers working group involvement, educational materials, and other programs the Forest uses to reduce human-grizzly bear conflicts. Current involvement in such activities establishing the environmental baseline is provided in the section addressing effects of the action (III.A.6 Effects of the Action) to improve continuity and better enable an assessment of effects relative to the existing baseline conditions.

I. Climate Change

Climate change could create temporal and spatial shifts in grizzly bear food sources (Rodriguez et al. 2007). Changes in plant community distributions have already been documented, with species' ranges shifting further north and higher in elevation due to environmental constraints (Walther et al. 2002; Walther 2003; Walther et al. 2005), outbreaks of insects, or disease (Bentz et al. 2010). Decreased snowpack could lead to fewer avalanches thereby reducing avalanche chutes, an important habitat component to grizzlies, across the landscape. On the other hand, increases in "rain on snow" events may decrease the stability of snowpack resulting in increases in avalanches. Changes in vegetative food distributions also may influence other mammal distributions, including potential prey species like ungulates. While the extent and rate to which individual plant species may be impacted is difficult to foresee with any level of confidence (Walther et al. 2002; Fagre et al. 2003), there is general consensus that grizzly bears are flexible enough in their dietary needs that they will not be impacted directly by ecological constraints such as shifts in food distributions and abundance (Servheen and Cross 2010). The best way to mitigate potential negative impacts from climate change is through well connected populations of grizzly bears.

m. Ongoing Projects Covered by Formal Consultations

Biological opinions were issued for the following actions under the existing Forest Plans, but full implementation of these actions will be completed after signing the record of decision for the CG Plan. All effects of these actions were considered during their individual consultations and incorporated into the environmental baseline for this biological opinion. However, all terms and conditions included in the biological opinions for these actions will remain active until these actions are completed.

Gallatin National Forest Travel Plan

Comprehensive management direction for travel management in parts of the action area will remain under the Gallatin National Forest Travel Plan. Consultation on the travel plan addressed effects to all subunits within the recovery zone, including subunits on the Custer Forest being administered by the Gallatin National Forest, and five of 11 BAUs outside the recovery zone. Full implementation of road closures identified under this travel plan is ongoing.

The 2006 biological opinion on the Gallatin Forest Travel Management Plan (U.S. Fish and Wildlife Service 2006) as amended in 2013 (U.S. Fish and Wildlife Service 2013) superseded all other biological opinions in regards to access management and travel management planning on the CG Forest, including those portions of the 1986 biological opinion on the effects of the Gallatin Forest Plan related to access management (U.S. Fish and Wildlife Service 1986), the 1995 administrative amendment to the 1986 biological opinion on the effects of motorized access (U.S. Fish and Wildlife Service 1995), the 2002 biological opinion and incidental take statement on the effects of snowmobiling (U.S. Fish and Wildlife Service 2002), and those portions of the 2004 biological opinion and incidental take statement on the effects of continued implementation of the Gallatin Forest Plan on grizzly bears that related to access management (U.S. Fish and Wildlife Service 2004).

Beartooth Travel Management Plan

Comprehensive management direction for travel management on the Beartooth District of the Forest will remain under the Beartooth Travel Management Plan with the exception of the area in Cooke City covered under the Gallatin National Forest Travel Plan. Because the decision for this travel plan was signed when grizzlies were delisted, grizzly bears were not included during

consultation. Reinitiation did not occur when grizzly bears were relisted. However, as discussed above, effects of travel management within subunits on the Beartooth District inside the recovery zone were included during consultation on the Gallatin National Forest Travel Plan. Consultation on effects of this travel plan to grizzly bears in BAUs outside the recovery zone has not occurred. Full implementation of road closures identified under this travel plan is ongoing.

Sibanye-Stillwater Mining Company's Iron Creek & West Fork Stillwater Exploration Plan of Operations

Section 7 consultation was completed in 2017 for exploratory drilling at up to thirty-six drill sites over a 6 year period in the Iron Creek area and a single drill site in the area of the West Fork of the Stillwater River. Adverse effects are due to temporary reduction in secure habitat for grizzly bears associated with low-level helicopter flights during project implementation.

Stillwater Mining Blitz Ridge Vent Raises and Group Ten Metals Mineral Exploration Plan of Operations

Section 7 consultation for this mineral exploration project was completed in 2019 and implementation will occur between 2019-2026. Adverse effects are due to temporary reduction in secure habitat for grizzly bears associated with low-level helicopter flights during project implementation.

North Hebgen Multiple Resource Project (NHMRP)

The 5-10 year implementation period for the NHMRP includes; (1) fuels reduction in the wildland urban interface, along evacuation routes, and along a powerline; (2) wildlife habitat improvement and maintenance in aspen and Whitebark pine habitats; (3) activities to enhance forest health and resiliency; and (4) treatments to improve public and wildlife safety. Consultation was completed in 2017 but has not been started due to ongoing litigation. Adverse effects to grizzly bear are due to a temporary reduction in secure habitat from project roads and human presence.

Lonesome Wood 2 Fuels Reduction

This fuels reduction project includes commercial thinning, small-tree thinning, and broadcast burning to promote regeneration of aspen. Approximately 3.7 miles of temporary road will be constructed, and 1.4 miles of road will be reconstructed. Section 7 consultation was completed in 2012 and all harvest activities have been completed. Additional fuels reduction activities such as prescribed burning will continue with an anticipated completion in 2025. Adverse effects to grizzly bear are due to a temporary reduction in secure habitat from construction of project roads and human presence.

Bozeman Municipal Watershed Project

The purpose of this project on 4,818 acres in the Bozeman Municipal Watershed project is to reduce the risk of excess sediment and ash from reaching the municipal water treatment plant in the event of a fire and treat road corridors to provide safety for firefighters and the public. Consultation was completed in 2009 but the start of implementation for the 5-12 year project was delayed until 2021 due to ongoing litigation. Potential underuse of key feeding areas within the home range of adult females due to disturbance from helicopter logging and a temporary

reduction in secure habitat from project roads and human presence is not likely to result in jeopardy to the species.

East Paradise Range Allotments Management Plan Revision

This project revises the permit type, turn-on dates, allotment boundaries, and utilization levels for six livestock allotments on the Forest totaling approximately 20,448 acres. Consultation was completed in November 2021. Effects to grizzly bears are the potential increased chances of a grizzly bear livestock conflict, habituation and/or learned use of bear attractants, displacement due to management activities, and direct competition for preferred forage species. Although there have not been any grizzly bear-livestock conflicts in the area or management relocations of grizzly bears from the allotments, the Service anticipates the possibility of management removal occurring for one family unit (i.e., one female and her cubs) during the 10-year permit term due to: (1) increases in the range and population of grizzly bears and, (2) increases in the net acreage and period of use for the allotments. Because the potential for management removal is low and is reduced by measures implemented under the plan, the Service determined it was not necessary to provide reasonable and prudent measures or terms and conditions and that the anticipated take is not likely to result in jeopardy to the species.

III.A.4 Status of the Species in the Action Area

Reported in Status of the Species, section III.A.1.

III.A.5 Factors Affecting Species Environment

See Table III-1

III.A.6 Effects of the Action

a. Motorized Access

1. General Effects During the Non-Denning Season

The management of human use levels through access route management is one of the most powerful tools available to balance the needs of grizzly bears with the needs and activities of humans (ICST 2016, p. 29). Roads and associated human activities impact grizzly bears by displacing them from important habitats and lowering their survival rates during the non-denning season (Mace et al. 1996; Mattson et al. 1987; McLellan and Shackleton 1989; Waller and Mace 1997). Grizzly bears may adjust their habitat use patterns in response to total road densities, open road densities, and traffic levels (Mace and Manley 1993). Although roads can reduce the amount of vegetative habitat available for grizzly bears, direct habitat loss due to the road's footprint is not considered a major factor (see Proctor et al. 2018, p. 7).

Route Types and Grizzly Bear Response

Grizzly bears generally avoid all open roads, regardless of habitat availability (Kasworm and Manley 1990, p. 80), and traffic volume (Northup et al. 2012; McLellan and Shackleton 1988, p. 455-456; Wielgus et al. 2002, p. 1600; Mace et al. 1999 p. 1402). Specifically, highways have been identified as a major contributing factor in habitat and population fragmentation (Proctor et al. 2012, entire); in the southern Canadian Rocky Mountains, the odds of grizzly bear movement through an area was reduced by up to 44 percent by highways (Apps et al. 2013, p. 103).

Grizzly bears may avoid roads restricted to administrative use less than roads open to the public (Kasworm and Manley 1990, p. 83; Wielgus et al. 2002, pp. 1,600-1,601), although traffic levels on restricted roads can influence the degree to which grizzly bears avoid the road (Archibald et al. 1987, p. 87; Kasworm and Manley 1990, p. 83). None of the grizzly bears in the Selkirk Mountain study area avoided restricted roads (Wielgus et al. 2002, p. 1601) and Northup et al. (2012, p. 1,164) found grizzly bears in southwestern Alberta used habitat near restricted roads similar to unroaded habitat. In contrast, Mace et al. (1996, p. 1,402) found some grizzly bears in the Swan Mountains of Montana avoided closed roads receiving fewer than 1 vehicle per day. Although restricted roads likely have a lesser effect on grizzly bears than motorized routes open to the public, the degree of avoidance to restricted roads may depend on perceived mortality risk stemming from the amount of motorized use, degree of local hunting pressure, history of mortality risk in the area, and association with other nearby roads.

Motorized trails that accommodate smaller wheeled vehicles such as ATVs or motorcycles can still result in disturbance or displacement to grizzly bears. However, Benn and Herrero (2002) suggested 200 meters around a motorized trail was the zone of influence for bears versus 500 meters for roads. Similarly, Wakkinen and Kasworm (1997, p. 13) determined bear response to vegetated and barriered roads (e.g., roads that are decommissioned, stored, or obliterated) appeared more similar to unroaded habitat.

Mortality Associated with Motorized Access Routes

Highways and high speed roads pose the risk of direct mortality due to bear-vehicle collisions. The mortality risk can vary based on visibility, crossing structures, and habitat types near the roads.

Motorized access routes facilitate human access into grizzly bear habitat which indirectly increases the risk of human-caused mortality that affects the ability of bears to survive and reproduce (Nielson et al. 2004, p. 108; McLellan 2015, pp. 755-756; Proctor et al. 2018b, p. 4). Where locations relative to roads were known for the Selkirk and Cabinet-Yaak Recovery Zones, 80 percent of human-caused mortalities occurred within 500 meters of an open road (Kasworm et al. 2019a, pp. 12-14; Kasworm et al. 2019b, pp. 16-18).

Similar patterns have been documented elsewhere (Schwartz et al. 2006, pp. 29, 34-35; Boulanger and Stenhouse 2014, p. 9; McLellan et al. 2015, p. 756). In southeastern British Columbia, 86 percent of radio-collared bears were killed within 120 meters of a backcountry road (McLellan 2015, p. 756) and in Alberta 100 percent of radio-collared bears were within 100 meters of gravel roads or highways (G.B. Stenhouse, unpublished, as reported in Proctor et al. 2020, p. 20). Research in Canada found grizzly bear mortality was best predicted by measures of human access, such as road density, distance to roads, highways, and low elevation habitat (Nielson et al. 2004, p. 108; Proctor et al. 2017, p. 31). In the GYE, grizzly bear survival was best explained by models including human development, open road density, and secure habitat (Schwartz et al. 2010, p. 657).

Habitat Avoidance and Habituation Associated with Motorized Access Routes

Research has also indicated that grizzly bears are consistently displaced from habitats adjacent to roads, often despite relatively low levels of human use (Mattson et al. 1987; Aune and Kasworm 1989; Kasworm and Manley 1990; Mace and Manley 1993). Avoidance of habitat near roads has the potential to reduce grizzly bear habitat effectiveness, body condition, reproductive rates, and ultimately population density (McLellan and Shackleton 1988; Mace et al. 1996; Hertel et al.

2016). Avoidance is a learned behavior that is passed from females to cubs, and may therefore occur for more than one generation of grizzly bears.

Grizzly bears may forego key food resources that occur near motorized access routes and travel further to find suitable habitat. When roads are located in or near important seasonal habitats, such as riparian areas, snowchutes, or shrub fields, habitat loss through avoidance behavior can be significant (Apps et al. 2016, p. 406). Alternatively, in areas where forage is abundant, grizzly bears may be able to meet their life history needs despite the habitat loss associated with avoidance of roads and human activity (McLellan 2015, p. 762).

Avoidance behavior related to motorized access routes may be strongest in adult grizzly bears and depend on sex and periods of greatest human activity. Adult males using high quality habitat near roads did so during the night where hiding cover was available (Gibeau et al. 2002). However, adult females were more likely to avoid humans all together rather than seek out the highest quality habitats. Mueller et al. (2004) determined that regardless of the time of day, subadult bears were found closer to high-use roads than adult bears.

On the other hand, some grizzly bears can become conditioned to areas of high levels of human activity and motorized access routes. If the location and nature of human use are predictable and do not result in overtly negative impacts for grizzly bears (Mattson 1993), areas with higher levels of human activity might have a positive effect for bears by serving as a refugia for weaker population cohorts (e.g., subadults and females with cubs) seeking to avoid intra-specific competition (adult males; Mattson 1993; Yonge 2001). In Glacier National Park, Jope (1985) suggested grizzly bears in parks habituate to high human use and showed less displacement, even in open habitats. Yonge (2001) found that grizzly bears near Cooke City, Montana, were willing to consistently forage in very close proximity to high levels of human use if cover was sufficient and energetically efficient feeding opportunities were present.

However, habituation may not always be beneficial. Mattson (1993) qualified his observation by adding that beneficial effects vary as to whether hunting is allowed and how closely the human population is regulated. Food conditioned grizzly bears are also much more likely to be killed by humans.

2. General Effects During the Denning Season

Use by over-snow motorized vehicles is the dominant motorized access during the denning season. Snow is an excellent sound barrier (Blix and Lentfer 1992) and impacts to denning bears from over-snow motorized vehicles would likely be less in deep snow situations than in shallow snow conditions. It is likely that hibernating bears exposed to meaningless noise, with no negative consequences to the bear, habituate to this type of disturbance (Knight and Gutzweiler 1995).

Disturbance from over-snow motorized vehicles may be most consequential at the period of den emergence for a female with cubs (Graves and Reams 2001). Females and their cubs remain in the area of the den site for several weeks after den emergence (Haroldsen et al. 2002, p. 33; Mace and Waller 1997, pp. 37-38) and seek sites that melt snow early and produce green vegetation (Kasworm et al. 2010, p. 65). They have high energetic needs and cubs have limited mobility for several weeks after leaving the den. Disturbance levels that cause a female to prematurely leave the den in spring or move from the den area could impair the fitness of the female, safety of the cubs, and force them into less suitable habitat.

To date, there are no primary-source reports in the literature of grizzly bear den abandonment directly attributed to over-snow motorized vehicle activity (Hegg 2010 pp. 26-27; Servheen 2010

pers. comm. as cited *In* U.S. Fish and Wildlife Service 2011b, p.34) U.S. Fish and Wildlife Service 2008) nor has other substantive adverse effects been substantiated (Mace and Waller 1997, p.41; U.S. Forest Service 2006, pp.3-263 3-373). However, detection of such events may go unreported and may likely depend on site-specific conditions determining snow depth, elevation, and accessibility to areas where snow persists into the spring. Availability of denning habitat is not considered a limiting factor for grizzly bears in the GYE; approximately 66 percent (6,815 km² (2,631 mi²)) of the GYE is potential denning habitat that is well distributed across the area (Podruzny *et al.* 2002, p. 22).

3. Environmental Baseline

Motorized Access addresses on- and off-route motorized access and use on the Forest, including motorized routes for recreation, administration use, developed sites, and those associated with project implementation. Included in this category are motorized access routes and off-route motorized use for the stressors Developed Recreation Sites, Mineral and Energy Development, Recreation, Vegetation Management, and Activities Disturbing Dens (Table III-1). Skid trails used for logging projects are not considered motorized access because they typically occur within harvest units or extend short distances between harvest units and temporary or permanent haul roads. Use of skid trails is therefore considered part of the overall mechanical disturbance/human presence aspects of logging projects when they occur within the disturbance footprint. The term “motorized” includes cars, trucks, motorcycles, ATVs, E-bikes (all bicycles with battery operated motors for assistance), and over-snow motorized vehicles. This category also includes all recurring helicopter flight lines at low elevations.

Motorized access is split into the denning season and non-denning season due to differences in types of motorized vehicles used, management direction, and differences in grizzly bear activity patterns between these seasons. For management purposes, the denning season for grizzly bears in the GYE is considered to be December 1 to February 29 and the non-denning season from March 1 to November 30. Metrics and analysis of effects for motorized access is provided below in section C. Secure Habitat.

Motorized access is directed by the Beartooth Travel Management Plan on the Beartooth District of the CG Forest and the Gallatin National Forest Travel Plan for the remaining portion of the grizzly bear action area. To implement the travel plans, motor vehicle use maps (MVUM) identify roads, trails and areas designated for motor vehicle use under 36 CFR 212.51. These designations apply only to roads, trails, and areas on National Forest System lands. It is prohibited to possess or operate a motor vehicle on National Forest System lands on the Custer Gallatin National Forest other than in accordance with these designations and is the responsibility of the user to acquire the current MVUM.

Non-compliance with travel management regulations are illegal private activities that are not considered a Forest action. The term “action” for Section 7 consultation is defined in the Consultation Handbook (U.S. Fish and Wildlife Service, National Marine Fisheries Service 1998) as; *all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas.* These, and any other illegal activities are not the result of a Federal action and therefore not analyzed under effects of the action, but their potential influence is considered for describing the environmental baseline.

Enforcement of the travel plan, monitoring, and appropriate management actions to correct illegal use was determined to be important by the Forest (U.S. Forest Service 2006) and incorporated into terms and conditions of the biological opinion for the Gallatin National Forest

Travel Plan (U.S. Fish and Wildlife Service 2006). The 2019 annual report for the travel plan biological opinions stated that, to the best of their knowledge, there was no unauthorized use of permanently barricaded routes during 2017 or 2018 and that approximately 200 warnings or tickets for travel management violations were issued (U.S. Forest Service 2019).

Any non-compliance with travel management regulations on the CG Forest would be considered to have an insignificant influence on baseline conditions. It is likely that illegal motorized use is spatially disparate and temporary; most Forest users follow travel regulations, and the CG Forest corrects the situation when it is observed or becomes apparent. Treatments for decommissioning/obliterating roads would be considered effective in preventing illegal motorized access. Because all roads are considered the same (whether open to the public or restricted) for analyzing effects to grizzly bears, illegal motorized use of restricted roads does not reduce the metrics for effects to grizzly bears.

4. Proposed Changes and Effects During the Non-Denning Season

The CG Plan does not change the designated status or allowable uses of motorized or non-motorized access routes designated under the Gallatin National Forest Travel Plan or the Beartooth Travel Management Plan. However, management direction associated with land use designations under the CG Plan prevents or places constraints on roads in backcountry areas, recommended wilderness, inventoried roadless areas, and other land designations. Area specific constraints on new road construction is provided in the draft CG Plan (U.S. Forest Service 2021). Inside the recovery zone, grizzly bear direction dictates how roads, motorized trails, facilities and aircraft use could affect grizzly bears. Beyond the grizzly bear direction, the revised plan contains plan components for infrastructure including a desired condition that the Forest transportation system has minimal impacts on threatened species (*FW-DC-RT 01*).

5. Proposed Changes and Effects During the Denning Season

The CG Plan does not make changes to areas where over-snow motorized vehicle use is allowed during the denning season, but provides management direction that reduces potential effects to grizzly bears. *FW-SUIT-WLGB 01(c)* stipulates that where otherwise allowed (e.g., outside of designated wilderness) non-wheeled over snow use is suitable in otherwise secure habitat for grizzly bears during the winter denning season, unless such use results in grizzly bear den abandonment, bear-human conflicts shortly after den emergence, or new research identifies a threat. Restrictions on the designation of winter routes in maternal wolverine habitat (*FW-GDL-WLWV 01*) could also benefit denning grizzly bear.

Designation of the Cooke City Winter Recreation Emphasis Area and the Hebgen Winter Recreation Emphasis Area under the CG Plan are within the recovery zone in areas where snow generally persists past the time of den emergence by grizzly bears. However, these areas have historically received a large amount of over-snow motorized vehicle use. It is unlikely that designation of these winter recreation emphasis areas would increase the likelihood of den abandonment or conflicts upon den emergence due to existing avoidance or habituation to over-snow motorized vehicle use and the availability of undisturbed denning habitat in designated wilderness adjacent to the recreation emphasis area.

b. Developed Sites on Federal Land

1. General Effects

The primary concern related to developed sites is direct mortality from human-bear conflicts, such as unsecured attractants (e.g., food and garbage), and resulting management removals (Harding and Nagy 1980, p. 277; McLellan and Shackleton 1988, p. 451; Mattson and Knight 1991, p. 3; Mattson *et al.* 1992, p. 432; Mace *et al.* 1996, p. 1403; McLellan *et al.* 1999, p. 918; Woodroffe 2000, entire; Johnson *et al.* 2004, pp. 974–975). Secondary concerns include temporary or permanent habitat loss and displacement due to increased length of time of human use and increased human disturbance to surrounding areas (Harding and Nagy 1980, p. 277; McLellan and Shackleton 1988, p. 451; Mattson 1990, entire; White *et al.* 1999, pp. 3–5; Fortin *et al.* 2016, pp. 9–19).

2. Environmental Baseline

Developed Sites on Federal Land refers to all sites developed or improved for human use or resource development, including campgrounds, trailheads, lodges, administrative sites, service stations, summer homes, restaurants, visitor's centers, and permitted resource development sites such as oil and gas exploratory wells, production wells, plans of operation for minerals activities, work camps, etc. (Yellowstone Ecosystem Subcommittee 2016). This category contains developed locations defined under the stressors Developed Recreation Sites and Mineral and Energy Development other than motorized access routes or recurring flight lines that service or provide access to these sites. Radio repeater towers, interpretive signs at road pullouts, and similar sites are not considered as meeting criteria as developed sites. Developed sites are not monitored and requirements do not apply for developed sites outside the recovery zone.

Other than for approved exceptions under the application rule (Yellowstone Ecosystem Subcommittee 2003), the 2006 amendment to the existing Forest plans (U.S. Forest Service 2006) calls for maintaining the number and capacity for human use of developed sites within the recovery zone at levels occurring in 1998. Under this scenario, a "site" is considered a point on the landscape without regards to the spatial extent of the developed site; a 50 unit campground is considered to occupy the same area as a trailhead.

Table III-2 indicates the number and type of developed sites for each subunit within the recovery zone that overlaps land on the CG Forest. These numbers are specific to the CG Forest and do not consider the number of developed sites under different Forests or National Park Service direction when subunits encompass lands under multiple jurisdictions. A specific metric providing the "capacity for human use" at developed sites listed in Table III-2 is not calculated or tracked over time.

Subsequent to a review of the developed site database and additional information provided during consultation on the CG Plan (CG Forest 2021, pers. comm.), Table III-2 provides updated information on the number and type of developed sites from information provided in the 2016 Conservation Strategy (YES 2016), the BA for the CG Plan (U.S. Forest Service 2020) and other documents for the following reasons:

- Additional sites not previously identified in the 1998 baseline were found and vetted to confirm they existed prior to 1998.
- The creation of new sites resulted in the closure of existing sites as project level mitigation.

- Additional sites from acquisition of property through land exchanges or donations.
- Sites may have been reassigned into different subunits based on better location data or incorrect assignment in 1998.
- Sites that were originally considered sub-parts of a single developed site complex in 1998 are now listed individually to more accurately track what's on the landscape.
- Previous designation was unclear and may have been left off the list that subsequent updates included.

Table III-2. Current number, type, and total developed sites on the CG Forest within each subunit and 1998 baseline total number of developed sites on the CG Forest within each subunit.

<i>Subunit</i>	<i>Admin.</i>	<i>Developed</i>	<i>Overnight</i>	<i>Other</i> ¹	<i>Total</i>	
	<i>Sites</i>	<i>Campgrounds</i>	<i>Lodging</i>		<i>2019</i>	<i>1998</i>
Boulder/Slough 1	1	1	0	12	14	20
Boulder/Slough 2	2	0	0	0	2	2
Crandall/Sunlight 1	0	2	0	7	9	9
Crandall/Sunlight 2	0	0	0	0	0	0
Hellroaring/Bear 1	3	4	0	27	34	34
Hellroaring/Bear 2	1	0	0	1	2	2
Lamar 1	6	2	0	18	26	26
Gallatin 3	2	0	0	15	17	17
Henry's Lake 2	0	3	0	12	15	14
Hilgard 1	2	0	1	7	10	11
Hilgard 2	1	0	0	6	7	6
Madison 1	1	1	0	18	20	21
Madison 2	4	2	1	14	21	21
Plateau 1	0	0	0	0	0	0
Total					177	183

¹ Includes trailheads, plan of operations for mining, day use sites, etc.

3. Changes and Effects Inside the Recovery Zone

Since 2007 when grizzly bear habitat standards were first implemented, visitation on public lands throughout the GYE has increased significantly. In response to the administrative challenge of managing the increased number of visitors to the GYE, land managers requested that the 1998 habitat standards were reevaluated (Landenburger 2018 *in van Manen et al.* 2019). The Developed Sites Technical Team was established to make recommendations for changing the habitat standards and applications rules that would provide managers the flexibility for authorizing new infrastructure to accommodate the increased visitation (Ibid). A placeholder was written into the 2016 Conservation Strategy calling for these new methods of tracking human development on public lands throughout the PCA (Developed Site Technical Team 2019, Landenburger 2018 *in van Manen et al.* 2019).

The existing method designating a single point feature for tracking developments does not provide a realistic system for monitoring and tracking spatial changes in developed sites over time. Typically, developed sites are comprised of multiple structures, roads, and/or facilities that are more accurately represented as zones of human activity rather than a single point that is currently used. The Developed Sites Technical Team recommended using the “footprint approach” for delineating larger developed sites.

Categories of developed sites that warrant footprints include: (a) expansive developed areas with permanent infrastructure and invested management capital accommodating a relatively high level

of administrative and/or recreational use, and (b) those areas identified by land managers as having the greatest need for infrastructure growth. These categories include: (1) **Administrative** sites or facilities constructed for use primarily by government and concessionaire employees, (2) **Visitor Overnight** sites comprised of multiple overnight structures accommodating overnight guest use via special permits (visitor lodges and guest ranches), (3) front-country developed **Campgrounds** on National Forest lands, and (4) **Major Developments** characterized as expansive areas on National Park lands that typically host a complex combination of administrative and visitor use (Developed Site Technical Team 2019). Sites that do not warrant a footprint and are characterized as isolated point sources of human activity that support minimal infrastructure and demonstrate little need for enhanced infrastructure including day use picnic areas, boat ramps, isolated backcountry patrol and rental cabins, and trailheads.

Methods for delineating footprints utilize a Geographical Information System (GIS) to generate convex hull polygons encompassing motorized access, buildings, and other infrastructure of developed sites (Developed Site Technical Team 2019; Figure III-4). A parameter within the GIS tool determines how tightly a footprint boundary follows a site's unique road configuration and an internal buffer distance of 60-meters is applied to ensure the footprint would capture infrastructure between site access roads and the footprint boundary (*Ibid*). The resulting polygon defines the overall area of infrastructure within developed sites.



Figure III-4. Footprint approach delineating the convex hull polygon for the Beaver Creek Campground on the CG Forest.

The term “capacity for human use of developed sites” was never explicitly defined in the recovery plan, conservation strategies, or other documents providing management direction on the CG Forest within the recovery zone. Recent suggested revisions to the 2016 Conservation Strategy included changing the term “capacity for human use of developed sites” to “capacity for overnight visitor use”. Therefore, “capacity for human use of developed sites” will be considered as “capacity for overnight visitor use” throughout this biological opinion. This definition provides an easy conversion to the number of overnight visitors in lodges and guest ranches that operate under special use permits on the CG Forest and existing number of overnight guests is known. Relative to front-country developed campgrounds on the CG Forest, this term could be considered as either the number of people within a campground or the number of campsites. The number of campsites is used for two reasons:

- Application rules in the 2016 Conservation Strategy for developed sites utilizes the number of campsites rather than the number of people when considering mitigation measures for increases in human capacity at developed campgrounds; “*Consolidation and/or elimination of dispersed campsites is considered adequate mitigation for increases in human capacity at developed campgrounds if the new campsite capacity is less than or equivalent to that of the dispersed camping eliminated and if future overnight use of the dispersed site(s) is definitively curtailed.*”
- Unlike the number of people at a campground that is constantly changing depending on group size, season, etc., the number of campsites within a developed campground is static and can be tracked over time.

Although modifications of developed site standards have not been finalized in a revised Conservation Strategy for grizzly bears, the CG Plan includes the following plan elements based on draft recommendations from the Developed Site Technical Team and proposed revisions to the Conservation Strategy that contain changes to existing developed sites standards within the recovery zone/ PCA for grizzly bears:

FW-GDL-WLGB 02: Developed Sites. To minimize risk of disturbance, displacement, and human-caused mortality of grizzly bears inside the recovery zone/primary conservation area, changes to existing, or construction of new developed sites should meet the following conditions:

- a. Temporary work camps associated with major projects or emergency response should be placed in low grizzly bear use areas to minimize disturbance and displacement of bears as well as to reduce risk of bear-human conflicts.*
- b. For proposed applications for permit to drill, and new or revised operating plans within existing oil and gas and other mineral leases, the Forest Service should, to the fullest extent of their regulatory authority, strive to meet the developed site standard. The Forest Service must meet the developed site standard when permitting new leases, applications for permit to drill, and operating plans.*
- c. Overnight developed site expansion should occur in the area within the authorized footprint of a site that existed in 1998 unless expansion as outlined in FW-STD-WLGB-05(c) would have a greater benefit to grizzly bears and other resources.*

FW-STD-WLGB 04: Developed Sites; Within Authorized Footprints and Primary Roads. Inside the recovery zone/primary conservation area, new infrastructure designed to accommodate additional human capacity for administrative and/or public use may be allowed within the authorized footprint of a site that existed in 1998 or the area within 300 meters of a primary road that existed in 1998 (see plan appendix F for map of authorized footprints and primary road segments affected). Any such increases shall meet the following conditions:

- a. All new infrastructure needed to accommodate increased capacity at existing developed sites shall be completely contained within the authorized footprint for the site. Exceptions may be made only for emergency administrative and maintenance infrastructure needed to reduce resource damage or minimize potential for bear-human conflicts where such infrastructure cannot feasibly be accommodated within the authorized footprint.*
- b. Added capacity at existing resorts that operate under special use permit shall not exceed ten percent increase over use authorized in 1998.*
- c. All infrastructure associated with new developed sites along primary roads shall: 1) be located no more than 300 meters (approximately 1000 feet) from the edge of the primary road, 2) be for day-use only (see glossary), 3) be non-commercial in nature, 4) be located outside of known wildlife crossing areas, riparian areas, ungulate calving/fawning grounds, and whitebark pine stands, and 5) affect no more than 10 percent of the existing mapped primary road corridors. Any new roads associated with new developed sites within 300 meters of a primary road shall not reduce existing secure habitat below established baseline levels.*

FW-STD-WLGB-05: Developed Sites; Outside Authorized Footprints and Primary Roads. Inside the recovery zone/primary conservation area, the number and capacity of developed sites outside of authorized footprints, or more than 300 meters from a primary road shall be maintained at or below 1998 baseline levels, with the exception of FW-STD-WLGB-05(a) through (d) below. See glossary: baseline levels for grizzly bears, and plan appendix F for baseline developed site values. Construction of new sites or added human capacity at existing sites outside of authorized footprints or primary road buffers must be mitigated for by closure of, or reduction of capacity in, a comparable site within the affected bear management subunit, or as close as possible. Mitigation must be in place before, or concurrent with, construction at new or existing sites. Additional acceptable mitigation measures are listed below:

- a. For new or expanded developed sites based in statutory rights (such as 1872 General Mining Law, Americans with Disability Act, ANILCA, etc.), if mitigation cannot be accomplished within the affected subunit, commensurate compensation shall be made in the nearest subunit possible and changes in the two affected subunits become permanent changes to the baseline.*
- b. Modifications to dispersed recreation sites (outside of authorized footprints and primary road buffers), are allowed only where necessary to address ongoing resource damage or reduce potential for human-grizzly bear conflicts. Modifications shall accommodate the same type (such as day use vs. camping) and level (human*

- capacity) of use occurring at existing dispersed sites. Examples include, but are not limited to addition of toilets and/or bear-resistant food/garbage containers to address water quality, sanitation, and/or minimization of attractants.*
- c. Effective closure and elimination of overnight dispersed recreation sites and areas shall be required as mitigation for construction of a single new campground within each of four key gateway areas (Gardiner Basin, Hebgen Basin, Taylor Fork, Cooke City) where it will have a demonstrable benefit to grizzly bears and other resources. New campground development shall be commensurate with the site capacity provided by the eliminated overnight dispersed sites. Overnight dispersed sites replaced by the new campground must be restored and those areas shall be closed to the public for future vehicle access and overnight use. Effective closure shall not result in displacement of dispersed use to nearby areas.*
 - d. Temporary work camps associated with authorized projects (such as vegetation management) or emergency response (such as wildland fires) that cannot reasonably be accommodated off of national forest system lands or within existing developed sites, shall be designed to: minimize the footprint of use, include no new permanent infrastructure, and have all temporary infrastructure removed and vegetation restored immediately upon completion of work associated with the project or incident.*

As outlined in guideline *FW-STD-WLGB-05*, the intent of changes to existing developed sites or construction of new developed sites in the recovery zone is to minimize the risk of disturbance, displacement, and human-caused mortality of grizzly bears. However, changes provided in *FW-STD-WLGB 04* and *FW-STD-WLGB 05* compared to the existing forest plan could increase the capacity for overnight visitor use and the number of developed sites within the recovery zone.

FW-STD-WLGB 04 allows new infrastructure to accommodate additional human use within authorized footprints and locations within 300 meters of primary roads (see CG Plan Appendix F for locations of the five primary roads on the CG Forest within the recovery zone adjacent to the four entrances to Yellowstone National Park). As defined by *FW-STD-WLGB 04 (c)*, new developed sites along primary roads would be for day use only and outside high quality habitat. All infrastructure for these sites would occur outside secure habitat since it must be contained within 300 meters of the primary roads. New sites could result in the loss of secure habitat by extending unsecure habitat 500 meters from the infrastructure of these sites rather than 500 meters from the primary roads, but *FW-STD-WLGB 04 (c)* also mandates that these sites shall not reduce existing secure habitat below established baseline levels. Effects to grizzly bears would likely be insignificant in many situations because; (1) new sites are for day use, (2) outside high quality habitat and (3) are located along roads with generally high speed limits and high traffic volumes that increase the potential for disturbance. Specific effects to grizzly bears from any proposed new sites will be analyzed during site-specific consultation.

Table III-3, taken from the BA (U.S. Forest Service 2020) provides the size of the footprint, number of existing campsites, miles of existing roads, and results of a GIS exercise estimating the potential increase in number of campsites and roads for all developed campgrounds on the CG Forest. In summary, existing sites could increase from 460 to 703 and miles of roads could increase from 16.3 to 34.7. Although the increases in campsites and roads are likely

overestimated because they did not consider influences of topography, water, aesthetics, and other factors that would not permit construction of this potential increase in campsites within existing footprints, it is reasonable to expect that an additional 350 campsites (approximately half of the analyzed potential increase) could occur within existing developed campground footprints.

Table III-3. Footprint size, number of existing campsites, miles of existing roads, and potential increases in number of campsites and new roads for developed campgrounds on the CG Forest.

<i>Campground Name</i>	<i>Footprint Acres</i>	<i>Existing</i>		<i>Potential Increase</i>	
		<i>Sites</i>	<i>Roads (miles)</i>	<i>Sites</i>	<i>Roads (miles)</i>
Bakers Hole	67.1	75	1.9	59	1.5
Bear Creek	13.4	5	0.5	22	2.4
Beaver Creek*	133.9	64	2.9	204	9.1
Canyon	22.7	15	0.9	30	1.9
Cherry Creek	6.5	8	0.2	5	0.1
Chief Joseph*	11.4	6	0.4	17	1.2
Colter	37.7	18	1.3	57	4.2
Eagle Creek	29.3	15	0.8	44	2.3
Hicks Park	22.4	16	0.8	29	1.5
Lonesomehurst	17.2	27	0.7	7	0.2
Rainbow Point	55.3	86	1.7	25	0.5
Red Cliff	60.6	67	1.5	54	1.2
Soda Butte	54.6	27	1.6	82	4.7
Spring Creek	9.9	15	0.2	5	0.1
Timber Camp	10	3	0.3	17	1.6
Tom Miner	29.7	13	0.6	46	2.2
Totals		460	16.3	703	34.7

* Only 36 acres of the footprint for the Beaver Creek campground is inside the recovery zone and the Chief Joseph campground is currently closed

Increases in the number of campsites and roads at existing developed campgrounds could occur within the existing footprint and could increase the magnitude of disturbance at a campground but would not result in loss of secure habitat or a spatial expansion of the existing site. However, increased numbers of people using an area and potentially interacting with grizzly bears is an important issue in evaluating impacts of developed sites on grizzly bear survival (YES 2016 p. 72). Increased access to surrounding areas or backcountry trails and increases in unsecured attractants resulting from increases at developed campgrounds may also affect grizzly bears (YES 2016, Appendix H, p38).

FW-STD-WLGB 04(b) allows a 10 percent increase in added capacity at existing resorts operating under special use permits. There are only two developed sites on the CG Forest meeting this criteria. Increased capacity would add 2-3 overnight accommodations at one and up to 30 at the other. Due to containment of these additional accommodations within existing

footprints and the small number of additional overnight accommodations that could occur, effects to grizzly bears from additional capacity at these two sites is expected to be insignificant. Similarly, additional infrastructure at administrative sites is also expected to be insignificant due to containment within existing footprints and generally for day use only.

FW-STD-WLGB-05 (c) allows the creation of four new developed campgrounds, one in each of the four gateway areas (Gardiner Basin, Hebgen Basin, Taylor Fork, Cooke City). New campgrounds must provide a demonstrable benefit to grizzly bears and the capacity for overnight visitor use must be commensurate with capacity provided by the elimination of dispersed overnight sites. Overnight dispersed sites replaced by the new campgrounds must be restored and those areas shall be closed to the public for future vehicle access and overnight use. Effective closure shall not result in displacement of dispersed use to nearby areas. Consolidation of dispersed campsites into developed campgrounds would be beneficial to grizzly bears by eliminating low level disturbance in areas of existing dispersed camping and better monitoring of food and attractant storage requirements. Because there are currently six fewer developed sites on the CG Forest than there were in 1998 (Table III-2), the four additional developed campgrounds would not exceed the total number of developed sites occurring on the CG Forest in 1998.

Effects of the four additional developed campgrounds would depend on conditions in the subunit they would be located, including the influence of management actions under other federal jurisdictions within the subunit, effects to secure habitat, spatial extent of the campground, and habitat where it is located. The CG Plan is a framework programmatic action that does not authorize, fund, or carry out an action but provides direction for future actions that may be authorized, funded, or carried out by the Forest. Therefore, additional campgrounds subsequently authorized, funded, or carried out under the CG Plan will be addressed in subsequent section 7 consultations.

The CG Plan also addresses the need for increased capacity specific to the OTO administrative site in the Hellroaring Bear 1 subunit. The Forest Service acquired the OTO Dude Ranch in 1991 as part of the Northern Yellowstone Winter Range Acquisition Project. Prior to the acquisition, the OTO was an historic, privately-owned dude ranch dating back to the 1800s.

Activities at the OTO since acquisition have included preservation-associated work, housing for administrative personnel, and youth education groups, but there has been increased interest from the public to utilize the OTO facility for other purposes, most notably youth/environmental education. While there is no proposal or identified need to increase infrastructure within the administrative footprint, the CG Forest is proposing to increase the temporal aspect of use by the public beyond past allowable levels.

The plan contains a goal for the Forest Service to seek partnerships to provide a venue for conservation education, stewardship and innovative opportunities, while preserving the historic significance and use of National Registered Listed OTO Homestead and Dude Ranch property (*AB-GO-OTO 01*). Under the CG Plan, use of the OTO administrative site would not be opened to the general public under a rental program (*AB-STD-OTO 03*), non-administrative use of the facilities (e.g., buildings) would require authorization by special use permit or agreement (*AB-STD-OTO 01*), and group size would be limited to a maximum of 75 individual for overnight use, and 100 individuals for day use (*AB-STD-OTO 02*). Seasonal limits on overnight use during fall hyperphagia (*AB-GDL-OTO 01*) and den emergence in the spring (*AB-GDL-OTO 02*) will reduce the chance of human-grizzly bear encounters. Management direction under the CG Plan

is expected to minimize effects to grizzly bears from increased use of the OTO administrative site within the site footprint.

4. Changes and Effects Outside the Recovery Zone

The CG Plan does not provide specific direction to developed sites outside the recovery zone where specific requirements relative to grizzly bear habitat standards do not apply.

c. Secure Habitat

1. General Effects

Secure habitat is generally defined as the area outside the zone of influence of high levels of human disturbance to grizzly bears. The “zone of influence” has been documented to range from 100 meters to 914 meters (328-2,999 feet; McLellan and Shackleton 1988, p. 454; Kasworm and Manley 1990, p. 81, respectively; Gaines et al. 2003, p. 16). Mattson et al. in Yellowstone National Park (1987, pp. 269-270) and Mace et al. in the Swan Valley of Montana (1996, p. 1,402) found grizzly bears avoided areas within 500 meters of roads. Avoidance distance may be dependent on the season (Mattson et al. 1987; Mace et al. 1996; Roever et al. 2008) and density of vegetation near roads (Wielgus et al. 2002).

Studies have shown that female grizzly bears selected for, and survival was higher in, areas with greater secure habitat (review in Proctor et al. 2020, p. 25-26; Mace et al. 1996, p. 1,400; Wakkinen and Kasworm 1997, p. 20; Gibeau et al. 2001, p. 126; Schwartz et al. 2010, pp. 659-660). Secure habitat free of motorized access also provided an important component for successfully reproducing female grizzly bears (Mattson et al. 1987, p. 262; Mace et al. 1996, p. 1400; Wakkinen and Kasworm 1997, pp. 20-22). In the NCDE, Mace and Manley (1993, p. 20) reported substantive blocks of unroaded habitat were components of all adult female home ranges.

Where roads isolate secure habitats, grizzly bears are forced to travel through areas of higher mortality risk to meet their life history needs (Schwartz et al. 2010, p. 661). And, where high road densities are interspersed with high quality habitat, grizzly bears may be more willing to navigate high-risk roaded areas in order to access high quality habitat which, depending on the type of road, proximity to population centers, and tendency for people to kill bears, can have population level effects (Proctor et al. 2012, entire; Lamb et al. 2016, entire).

However, there are not published methods to definitively calculate specific metrics of secure habitat that is required for a healthy and recovered population. Grizzly bears are long-lived, opportunistic omnivores whose food and space requirements vary depending on a multitude of environmental and behavioral conditions and on variation in the experience and knowledge of each individual bear. Their home ranges overlap and change seasonally, annually, and with reproductive status. These characteristics make it difficult to develop universal habitat criteria across all ecosystems within the range of grizzly bears.

The 1998 revised Interagency Grizzly Bear Committee Taskforce Report (1998 Taskforce Report) recognized the differences in research, data collection, and analyses between ecosystems as well as implementation issues that had arisen (IGBC 1998 p. 1). Recognizing these differences but with the intent to provide a consistent approach between and within ecosystems, the 1998 Taskforce Report recommended the three basic parameters of; (1) open motorized route density, (2) total motorized route density, and (3) core area as the foundation for access

management for grizzly bears (*Ibid*). Therefore, each ecosystem subcommittee applies these recommendations based on ecosystem- specific information and recommend ecosystem specific habitat conditions that should be maintained to provide habitat security.

Road density and the amount of secure habitat (core area) contribute different, yet important, components influencing survival of grizzly bears (Proctor et al. 2019, p.26). In the GYE, Schwartz et al. (2010, p.661) determined the most important predictors of grizzly bear survival in their best model was both the amount of secure habitat within a bear's home range and road density outside secure habitat. Subsequently, Schwartz et al. (2010, p. 665) supported the continued protection of secure habitat for grizzly bears in the GYE and maintaining road densities in non-secure habitats at levels necessary to maintain source habitat, where survival is higher relative to sink habitat.

The differences between secure habitat and road density and the interaction between these metrics are illustrated in Figure III-5. Figure III-5A indicates the proportion of secure habitat greater than 10 acres in size, in this example 77 percent of the figure. Figure III-5B includes road density outside secure habitat. Although open and closed roads are not differentiated, the breaks used to illustrate road density in Figure III-5B are analogous to monitoring requirements within the GYE for Open Motorized Access Route Density (OMARD) greater than 1.0 mile/mile² and Total Motorized Access Route Density (TMARD) greater than 2.0 miles/mile². In this figure, 16.3 percent of the area contains road density greater than 1.0 mile/mile² and 1.5 percent of the area is greater than 2.0 miles/mile². Higher levels of secure habitat allow more habitat to be utilized within an area (e.g., a subunit of a BMU) but higher road densities outside secure habitat increase mortality risks and impede use and movement of secure habitat within a grizzly bear's home range. Any increase in road density could further increase mortality risk and reduce the utilization of secure habitat.

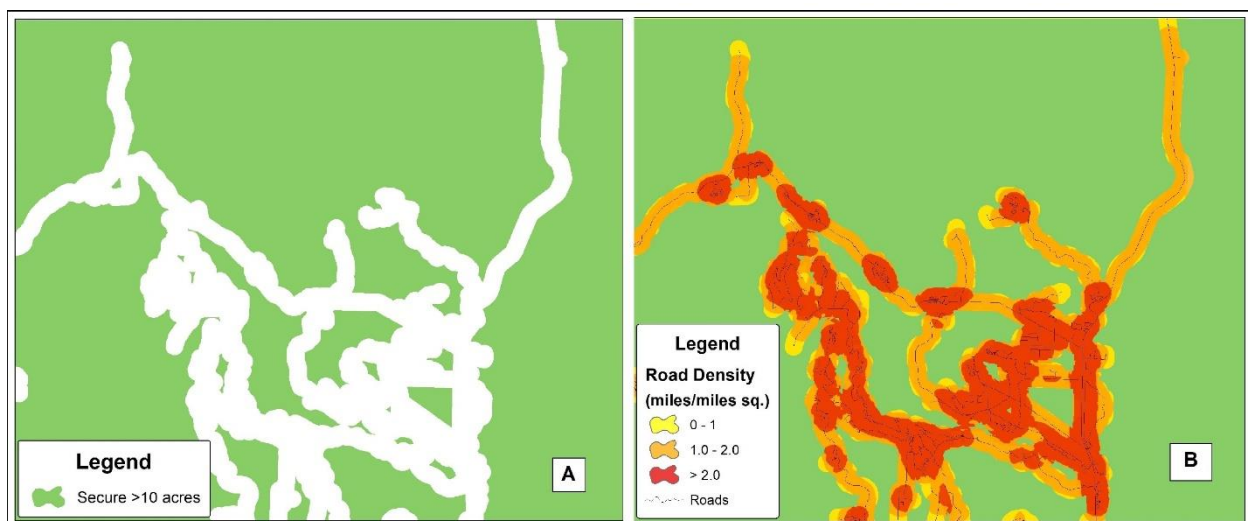


Figure III-5. Comparison of secure habitat and road density for a portion of a subunit within the recovery zone; (A) Secure habitat >10 acres in size; (B) Road density outside secure habitat.

Patch size of secure habitat is also an important consideration in the effectiveness of secure habitat. Although small patches of secure habitat may provide stepping stones to facilitate movement by bears, Gibeau et al. (2001, p.124) estimated the minimum daily foraging requirements for grizzly bears in Banff National Park, Canada, is 9km² (2,224 acres). Small patches of secure habitat may also be less effective if they are within a matrix of high road density (e.g., small patches in Figure III-5A). However, a small minimum patch size provides greater sensitivity for determining loss of secure habitat. Existing secure habitat calculated using a minimum patch size of 2,500 acres would allow many additional roads to occur in patches <2,500 acres without indicating a net loss in secure habitat. Comparatively, a minimum patch size of 10 acres would be much more sensitive to net losses in secure habitat from additional roads.

2. Environmental Baseline

Calculation of secure habitat on the CG Forest follows the metrics defined in the rule set for secure habitat management in the Yellowstone Primary Conservation Area (Table III-4; ICST 2003, 2007). It is defined as areas greater than or equal to 10 acres in size that are more than 500 meters from an open or gated motorized access route or recurring helicopter flight line at low elevations. Calculations apply to the non-denning season (March 1 through Nov. 30) and all motorized access routes, including motorized trails, highways, forest roads open to the public and forest roads behind locked gates that are restricted to administrative use are included in calculations of secure habitat. This method has been used throughout the GYE since 2003.

Table III-4. Rule set for secure habitat management in the GYE.

<i>Criteria</i>	<i>Definition</i>
Software, Database and Calculation Parameters	ARC INFO using the moving window GIS technique (Mace et al. 1996), 30 m pixel size, square mile window size and density measured as mi/sq mi. Motorized access features from the Cumulative Effects Model (CEM) GIS database
Motorized Access Routed in Database	All routes having motorized use or the potential for motorized use (restricted roads) including motorized trails, highways, and forest roads. Private roads and state and county highways counted.
Season Definitions	Season 1 – 1 March to 15 July. Season 2 – 16 July to 30 November. There are no access standards in the winter season (1 December to 28 February).
Habitat Considerations	Habitat quality not part of the standards but 1) Replacement secure habitat requires equal or greater habitat value 2) Road closures should consider seasonal habitat needs.
Project	An activity requiring construction of new roads, reconstructing or opening a restricted road or recurring helicopter flights at low elevations.

Secure Habitat	More than 500 m from an open or gated motorized access route or reoccurring helicopter flight line. Must be greater than or equal to 10 acres in size. Replacement secure habitat created to mitigate for loss of existing secure habitat must be of equal or greater habitat value and remain in place for a minimum of 10 years. Large lakes not included in calculations.
Activities Allowed in Secure Habitat	Activities that do not require road construction, reconstruction, opening a restricted road, or reoccurring helicopter flights. Over-snow use allowed until further research identifies a concern.
Inclusions in Secure Habitat	Roads restricted with permanent barriers (not gates), decommissioned or obliterated roads, and/or non-motorized trails.
Temporary Reduction in Secure Habitat	One project per subunit is permitted that may temporarily reduce secure habitat. Total acreage of active projects in the Bear Management Unit (BMU) will not exceed 1% of the acreage in the largest subunit within the BMU. The acreage that counts against the 1% is the 500-m buffer around open motorized access routes extending into secure habitat. Secure habitat is restored within one year after completion of the project.
Permanent Changes to Secure Habitat	A project may permanently change secure habitat provided that replacement secure habitat of equivalent habitat quality (as measured by CEM or equivalent technology) is provided in the same grizzly subunit. The replacement habitat either must be in place before project initiation or be provided as an integral part of the project plan.
Subunits with Planned Temporary Secure Habitat Reduction	Secure habitat for subunits Gallatin #3 and Hilgard #1 will temporarily decline below 1998 values due to the Gallatin Range Consolidation Act. Upon completion of the land exchange and associated timber sales, secure habitat in these subunits will be improved from the 1998 baseline.
Subunits with Potential for Improvement	Access values for Henrys Lake #2, Gallatin #3, and Madison # 2 have the potential for improvement. The quantity and timing of the improvement will be determined by the Gallatin National Forest Travel Management Plan.
Proactive Improvement in Secure Habitat	A proactive increase in secure habitat may be used at a future date to mitigate for impacts of proposed projects of that administrative unit within that subunit.
Exceptions for Caribou-Targhee National Forest	When fully adopted and implemented the Standards and Guidelines in the 1997 revised Targhee Forest Plan met the intent of maintaining secure habitat levels.

Only routes restricted by permanent barriers (not gates), decommissioned, or obliterated are included in secure habitat. The Interagency Grizzly Bear Committee (IGBC 1998, p3) defined a reclaimed/obliterated road as;

“a route which is managed with the long term intent for no motorized use, and has been treated in such a manner so as to no longer function as a road. An effective means to accomplish this is through one or a combination of several means including: recontouring to original slope, placement of logging, or forest debris, planting of shrubs or trees, etc.”

The Gallatin National Forest Travel Plan considers two treatment types to permanently remove roads from the system; Treatment Type II includes blocking the road entrances with an earthen berm, ripping and slashing, recontouring and slashing, or a mix of treatments, and Treatment Type III includes recontouring the prism to original ground profile as close as practical, and slashing and seeding open soils (U.S. Forest Service 2009, p. 24).

Baseline Levels of Secure Habitat and Road Densities Inside the Recovery Zone

Standards for secure habitat from the 2007 Conservation Strategy incorporated into management direction under the existing forest plan state that the percent of secure habitat within each bear management subunit must be maintained at or above levels that existed in 1998. Influences of roads on private lands that existed in 1998 were included in the 1998 baseline calculations but are not updated to reflect increases or decreases in roads on private lands that may have occurred since 1998. Application rules for calculating, maintaining, and changes that may occur in secure habitat are summarized in Table III-4.

Three BMU-subunits occurring on the CG Forest (Gallatin 3, Henrys Lake 2, and Madison 2; Table III-4) were considered in need of improvement over original 1998 levels of secure habitat. The quantity and timing of improvements that form the improved 1998 baseline levels is determined by the full implementation of the Gallatin National Forest Travel Plan (Table III-4). Further explanation of application rules can be found in the 2003, 2007 and 2016 Conservation Strategy.

Many BMU-subunits in the recovery zone overlap multiple administrative boundaries. To provide consistent and up-to-date calculations of secure habitat, the IGBST coordinates with all agencies, calculates, and reports current levels of secure habitat for all BMU-subunits in their annual reports. Secure habitat within the recovery zone is generally high, averaging about 87 percent over the entire recovery zone and ranging from 46-100 percent for individual BMU-subunits. The most current estimates of secure habitat from the IGBST (2018) and the current method for determining 1998 baseline levels for secure habitat on the CG Forest are provided in Table III-5. For the three subunits in need of improvements over actual 1998 levels (Gallatin 3, Henrys Lake 2, and Madison 2; Table III-4), numbers in parenthesis for the current method indicate improvements that will occur under full implementation of the Gallatin National Forest Travel Plan that define the required baseline improvements for these subunits.

Table III-5. Percent secure habitat in BMU subunits within the recovery zone on the CG Forest for 2018 and 1998 baseline levels using existing calculation methods and the revised method under the CG Plan.

<i>Subunit</i>	<i>2018 (%)</i>	<i>1998 Baseline (%)</i>	
		<i>Current Method</i>	<i>Revised Method</i>
Boulder/Slough 1	96.6	96.6	96.5
Boulder/Slough 2	97.7	97.7	97.6
Crandall/Sunlight 1	81.9	81.1	81.0
Crandall/Sunlight 2	82.7	82.3	82.3
Hellroaring/Bear 1	80.4	77.0	76.6
Hellroaring/Bear 2	99.6	99.5	99.5
Lamar 1	89.9	89.2	89.0
Gallatin 3*	72.5	55.3 (70.7)	55.1 (71.1)
Henry's Lake 2*	51.8	45.7 (51.7)	45.6 (52.0)
Hilgard 1	83.1	69.8	69.5
Hilgard 2	80.2	71.4	71.5
Madison 1	80.7	71.5	71.5
Madison 2*	67.5	66.5 (67.5)	66.3 (67.4)
Plateau 1	70.6	68.8	68.6

* Indicates subunits deemed in need of improvement from 1998 values. Numbers in parenthesis indicate improved values that will be achieved under full implementation of the Gallatin National Forest Travel Plan.

The Conservation Strategy itself does not impose mandatory standards on motorized route density, but changes in these parameters are monitored and reported annually for tracking purposes (van Manen et al. 2018, p. 113). However, in addition to maintaining 1998 baseline levels of secure habitat for BMU-subunits, the CG Forest proposed maintaining or improving 1998 baseline levels of OMARD greater than one mile/mile² and TMARD greater than 2 miles/mile² during consultation on the Gallatin National Forest Travel Plan (U.S. Forest Service 2006, p. 6). Terms and conditions to maintain 1998 baseline standards for secure habitat, OMARD, and TMARD were incorporated into the *Biological Opinion on the Effects to Grizzly Bears and Bald Eagles from the Gallatin National Forest Travel Plan* (U.S. Fish and Wildlife Service 2006, p. 62). The same terms and conditions were carried over into the *2013 Amended Incidental Take Statement for the 2006 biological opinion on the effect to grizzly bears from the Gallatin National Forest Travel Plan* (U.S. Fish and Wildlife Service 2013, p. 13). The most current estimates of OMARD and TMARD that define environmental baseline levels (van Manen et al. 2018) and 1998 baseline levels for OMARD and TMARD within BMU-subunits on the CG Forest is provided in Table III-6.

Table III-6. Percent OMARD >1.0 mile/mile² and TMARD >2.0 miles/mile² for 1998 baseline and 2018 for BMU-subunits occurring on the CG Forest.

<i>Subunit</i>	<i>OMARD (% > 1.0 mile/mile²)</i>		<i>TMARD (% > 2.0 miles/mile²)</i>	
	<i>1998 Baseline</i>	<i>2018</i>	<i>1998 Baseline</i>	<i>2018</i>
Boulder/Slough 1	3.2	3.3	0.3	0.4
Boulder/Slough 2	2.1	2.1	0.0	0.0
Crandall/Sunlight 1	19.3	18.5	7.2	6.3
Crandall/Sunlight 2	16.6	16.0	11.7	9.8
Hellroaring/Bear 1	23.1	18.4	15.8	12.1
Hellroaring/Bear 2	0.1	0.0	0.0	0.0
Lamar 1	9.9	9.7	3.8	4.0
Gallatin 3*	46.0	27.4	22.9	12.5
Henry's Lake 2*	49.9	40.6	35.2	28.3
Hilgard 1	29.0	13.3	15.3	4.4
Hilgard 2	21.0	16.1	13.6	4.6
Madison 1	29.5	20.3	12.5	7.5
Madison 2*	33.7	32.0	24.0	21.6
Plateau 1	22.2	19.0	12.9	10.3

* Indicates subunits deemed in need of improvement from 1998 values.

Treatment types for decommissioning/obliterating roads on the CG Forest that were previously described under Motorized Access would be considered effective in preventing reduction in secure habitat below 1998 baseline levels from illegal motorized use. Because all motorized access routes are considered the same (whether open or restricted) for calculating secure habitat for grizzly bears, illegal motorized use of restricted roads does not reduce secure habitat. Any off-road use or use of reclaimed/obliterated roads that may affect secure habitat would need to occur in areas currently considered secure habitat to result in a reduction in calculated values. Many of the BMU subunits have “surplus” secure habitat above 1998 baseline levels (Table III-5) and illegal motorized use in subunits with surplus secure habitat would need to reduce secure habitat below baseline levels to result in a significant adverse effect to grizzly bears. Therefore, it is unlikely that illegal motorized access would result in adverse effects to grizzly bears.

The 2013 amended incidental take statement for consultation on the Gallatin National Forest Travel Plan included a term and condition with reporting requirements to determine if motorized access route closure methods were effective at preventing wheeled motorized use. Reports provided by the CG Forest have indicated that closure methods have been effective.

Baseline Levels of Secure Habitat Outside the Recovery Zone

Outside the recovery zone where standards for secure habitat do not apply, the Gallatin National Forest Travel Plan initially identified Travel Planning Areas (TPA). Monitoring and reporting secure habitat in TPAs became a term and condition of the 2006 consultation (U.S. Fish and Wildlife Service 2006, p 63). To provide an analysis that is more consistent with BMU-subunits

within the recovery zone and better evaluate impacts to grizzly bears, the 2013 amended incidental take statement for the Gallatin National Forest Travel Plan (U.S. Fish and Wildlife Service 2013) included a change from TPAs to the BAUs developed and monitored by the IGBST (Schwartz et al. 2009, p. 70).

Consultation on the Gallatin National Forest Travel Plan included six BAUs outside the recovery zone and provided an estimate of temporary roads that would be constructed in the six BAUs over the following ten year period (2013-2023). Table III-7 provides percent secure habitat for the six BAUs covered by the Gallatin National Forest Travel Plan and all other BAUs on the CG Forest. Calculations include 2008 when a reliable dataset for estimating secure habitat outside the recovery zone first became available, current levels reported in 2018, and estimated miles of temporary road that would be constructed between 2013 and 2023 for the six BAUs covered by the travel plan. The 2013 amended incidental take statement for consultation on the Gallatin National Forest Travel Plan included a term and condition with reporting requirements to determine if motorized access route closure methods were effective at preventing wheeled motorized use. However, reporting requirements did not apply to BAUs other than the six addressed during travel plan consultation.

Table III-7. Percent secure in BAUs outside the recovery zone on the CG Forest for 2008 and 2018 and the estimated miles of temporary roads that would be constructed between 2013 and 2023.

<i>BAU</i>	<i>2008</i>	<i>2018</i>	<i>Estimated Miles of Temporary Roads (2013-2023)</i>
Boulder	64.8	69.7	10
Bozeman	45.6	59.3	25
Cooke City	99.6	99.6	5
Gallatin	52.3	59.6	25
Mill Creek	82.3	83.8	20
Quake Lake	85.0	92.1	5
Bridger*	28.3	38.4	na
Crazy*	57.2	67.9	na
Pryor Mountains*	38.8	38.8	na
Rock Creek*	83.8	83.8	na
Stillwater*	85.3	85.5	na

* = BAUs that were not included in travel plan consultations and where estimated miles of temporary roads was not estimated

2. Changes and Effects Inside the Recovery Zone

The CG Plan incorporates the footprint approach of major developed sites in addition to all open and restricted motorized access routes to calculate secure habitat. Developed sites are buffered by 500 meters around the footprint in the same method as used for motorized access routes. All major developed sites within a subunit, including those under the jurisdiction of other National Forests or the Park Service were included in calculations. There are no changes to conditions on the ground, the revised method is strictly a computational change. The revised method provides context for the spatial extent of major developed sites that using points for these sites lacked.

Revised estimates of secure habitat incorporating the footprint approach provide a new 1998 baseline of secure habitat that is a more accurate depiction of human disturbance that was occurring in 1998 and today. Table 3.5 includes the new baseline values for comparison to the current calculations of secure habitat. Changes in secure habitat between the two methods ranges from a 0.4 percent reduction to a 0.1 percent increase in secure habitat. For the three subunits in need of improvements over actual 1998 levels (Gallatin 3, Henrys Lake 2, and Madison 2; Table III-4), numbers in parenthesis for the revised method indicate improvements that will occur under full implementation of the Gallatin National Forest Travel Plan that define the required baseline improvements for these subunits. Reductions in 1998 baseline amounts of secure habitat are due to the area of the footprints. The single increase in secure habitat is due to improved accuracy of the linear routes present in 1998 (Landenburger 2019, unpublished *in* U.S. Forest Service 2020).

The revision to calculations of 1998 baseline levels of secure habitat are the only specific changes addressing secure habitat in the CG Plan. All metrics defined in the rule set for secure habitat (Table III-4) that were incorporated from the 2007 Conservation Strategy into the existing Forest Plan, including no reductions in secure habitat below revised 1998 baseline levels (*FW-STD-WLGB-01*) and restrictions on permanent reductions in secure habitat (*FW-STD-WLGB-02*) and temporary reductions in secure habitat (*FW-STD-WLGB-03*).

Changes in land designation under the CG Plan will not change the amount of secure habitat within each subunit but will maintain existing large patches of secure habitat. Figure III-6 indicates land designation under the CG Plan that would maintain large patches of secure habitat within each subunit occurring in part or entirely on the CG Forest, including existing designated wilderness, National Park Service lands, recommended wilderness under the CG Plan, and inventoried roadless areas under the CG Plan. Some subunits lie entirely on land with these designations, while the remainder contain patches of secure habitat much larger than the estimated size of 2,224 acres that provide minimum daily foraging requirements for grizzly bears (Gibeau et al. 2001, p.124).

3. Changes and Effects Outside the Recovery Zone

The CG Forest included estimates of secure habitat for all BAUs outside the recovery zone, including the five that were not part of the Gallatin National Forest Travel Plan as identified in Table III-7. Compared to subunits within the recovery zone, only the Bridger and Pryor BAUs currently contain less secure habitat than the lowest 1998 baseline level for subunits (51.7 percent for the Henrys Lake 2 subunit, as revised upwards from required improvements). The amount of secure habitat in these five BAUs has also trended towards an increase over the past 10 years (Table III-7). The CG Forest estimated that permanent reductions in secure habitat due to Forest Service management actions would not exceed 1 percent below full travel plan implementation for any BAU, and that total reductions (due to new permanent and temporary motorized routes combined) would not exceed 2 percent below full travel plan implementation for any BAU over the life of the CG Plan (U.S. Forest Service 2020). Inclusion of secure habitat for BAUs not analyzed during travel plan consultation and reductions in secure habitat due to temporary and permanent roads during the life of the CG Plan were included in our analysis of motorized access and secure habitat.

Land designation under the CG plan would maintain or increase large patches of secure habitat in BAUs outside the recovery zone (Figure III-6). Numbers and sizes of large patches of secure habitat vary by BAU, but land designations would maintain patches at least 8,000 acres in size within every BAU.

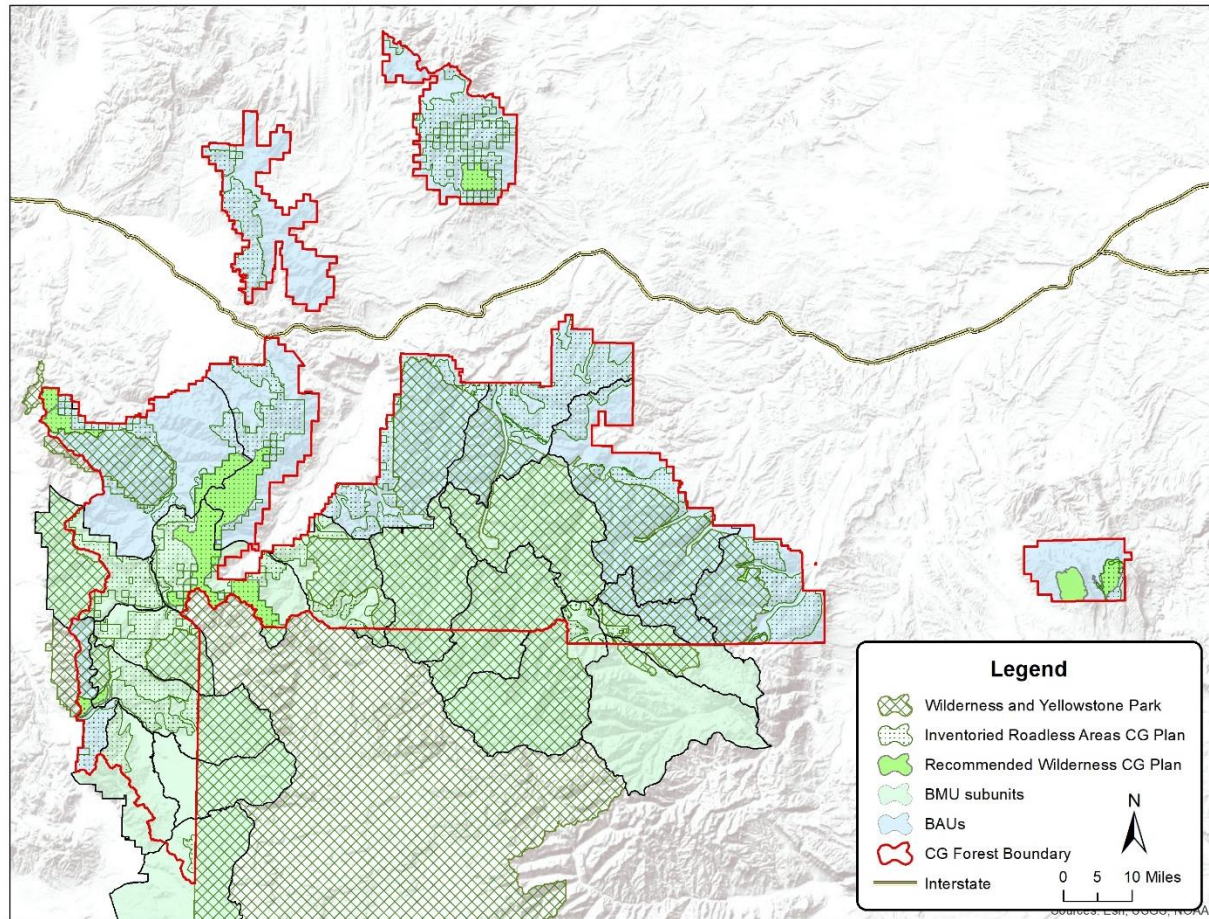


Figure III-6. Land designations under the CG Plan maintaining existing large patches of secure habitat.

d. Livestock Allotments

1. General Effects

Effects of livestock grazing on grizzly bears are generally related to food attractants and conflicts with humans. Grizzly bears may be attracted to ranging livestock, livestock carcasses, stored stock feed, or human food at ranches or camps for riders/herders. These circumstances can lead to grizzly bear habituation or food conditioning, both circumstances that lead to mortality risk for grizzly bears through management actions or defense of life situations. Where resources overlap, mainly in riparian areas, livestock grazing can also result in decreased foraging opportunity or reduced habitat quality for grizzly bears.

As opportunistic feeders, grizzly bears can learn to exploit livestock as an available food source as easily as they learn to exploit other human food sources (Johnson and Griffel 1982). Livestock depredations tend to occur independent of natural grizzly bear food availability (Gunther et al. 2004; Gunther et al. 2012). Once a bear successfully obtains a food reward at a particular location, the site is usually periodically rechecked for more food (Stokes 1970;

Meagher and Phillips 1983; Wilson et al. 2005). Chronic livestock depredation can ultimately lead to relocation or management removal of the grizzly bear from the population.

Most grizzly bears coexist with livestock and never prey on them. Grizzly bears that kill livestock include a range of ages and both sexes (Johnson and Griffel 1982) and can be influenced by the type and sex of livestock. In particular, adverse effects of domestic sheep grazing on grizzly bears are well documented (Knight and Judd 1983, Johnson and Griffel 1982). Knight and Judd (1983) found that all radio-collared grizzly bears killed sheep when they came in close contact to them, but most grizzly bears that encountered cattle did not make kills. They also reported that all known cattle kills were carried out by adult bears 7 years or older, both adults and subadults from 1 year to 13 years killed sheep, and that grizzly bears that killed sheep usually took multiple sheep over several days. Wells et al. (2019) found the presence of bull cattle or horses was associated with an approximately 50 percent reduction in depredations in the Yellowstone ecosystem.

The presence of livestock carcasses may attract bears to livestock allotments and away from natural food sources. Craighead and Mitchell (1982) reported grizzly bears moving 5 to 12 kilometer (3.1 to 7.5 miles) to feed on carcasses in Yellowstone National Park. Grizzly bears also have a strong tendency to return to a carcass for two or more feedings (Johnson and Griffel 1982), further increasing the potential for human-grizzly bear conflicts or management removal.

2. Environmental Baseline

In the GYE, the 1998 baseline and management policies limit the impact of livestock allotments on grizzly bears in the recovery zone. The *Recovery Plan Supplement: Habitat-based Recovery Criteria for the Yellowstone Ecosystem* (U.S. Fish and Wildlife Service 2007) and the existing direction amending the 2007 Conservation Strategy to the Forest Plan established habitat standards regarding livestock allotments. The number of active livestock allotments, total acres affected, and permitted sheep animal months within the recovery zone will not increase above 1998 levels (U.S. Forest Service 2006, p. 5; YES 2016, pp. 56, 67–68). Due to the higher prevalence of grizzly bear conflicts associated with sheep grazing, existing sheep allotments will be phased out as the opportunity arises with willing permittees (U.S. Forest Service 2006 p. 6; YES 2016, pp. 67–68). Table III-8 provides the number, type, and acreage of livestock allotments for 1998 baseline levels and current numbers inside the recovery zone and current numbers outside the recovery zone.

There have been a few livestock (cattle) depredations attributed to grizzly bears on the CG Forest in recent years. Depredations occurred in 2016 and 2017 inside the recovery zone on the Wigwam allotment. These were isolated incidents that neither led to recurring conflicts (defined as having occurred in three out of five preceding years), nor resulted in grizzly bear mortalities (van Manen et al. 2018). There were no grizzly bear-livestock conflicts reported on any CG Forest grazing allotments in 2018 (van Manen et al. 2019).

Table III-8. Number, type, and acres of livestock allotments inside the recovery zone (1998 baseline and 2019 current) and outside the recovery zone in 2019.

<i>Allotment Type</i>	<i>Inside the Recovery Zone</i>		<i>Outside the Recovery Zone</i>
	<i>1998 # (acres)</i>	<i>2019 # (acres)</i>	<i>2019 # (acres)</i>
Active Cattle/Horse	23 (91,157)	14 (57,252)	51 (223,482)
Vacant Cattle/Horse	10 (46,422)	5 (17,040)	12 (29,324)
Active Sheep	2 (91,570)	0	0
Vacant Sheep	4 (42,716)	0	0
Totals	39 (271,865)	19 (74,292)	63 (252,716)

3. Changes and Effects Inside the Recovery Zone

The CG Plan maintains existing standards that there shall be no increase in number or acres of livestock grazing above 1998 baseline levels (*FW-STD-WLGB 06*). *FW-STD-WLGB 07* allows the use of domestic sheep or goats for weed control, but stipulates if domestic sheep or goats are subject to depredation by grizzly bears, domestic sheep or goats will be removed from the area and that grizzly bears depredating on domestic sheep and goats for weed control shall not be removed unless additional circumstances indicate removal is warranted.

The CG Forest has a minimal history of recent livestock depredation, with the last known depredation occurring on a cattle allotments in 2016 and 2017. These were considered isolated incidents that did not lead to recurring conflicts (defined as having occurred in 3 out of 5 preceding years), nor resulted in grizzly bear mortalities (van Manen et al. 2018). However, livestock grazing is one of the few stressors that may result in removal of a grizzly bear from the population, either through management actions or defense of life situations. Renewal or reactivation of expired permits on existing allotments will undergo site-specific consultation to determine associated risks and effects of the proposed action.

4. Changes and Effects Outside the Recovery Zone

Standards and other plan components related to livestock allotments do not apply outside the recovery zone. No new permits would authorize grazing of domestic sheep or goats for livestock production anywhere in the montane ecosystem of the Forest (*FW-STD-GRAZ 02*).

e. Recreation

1. General Effects

Recreation can be divided into six basic categories based on season of use (winter or all other seasons), mode of access (motorized or non-motorized), and level of development (developed or dispersed) (U.S. Forest Service 2006, p. 187). Motorized recreation during winter and summer is addressed under Motorized Access and recreation at developed sites during all seasons (e.g., campgrounds and lodges during summer and skiing at established ski resorts during winter) is addressed under Developed Sites.

This section covers non-motorized dispersed recreation during the denning and non-denning seasons. Where land designations allow, it includes “*mechanized travel or transport*”, defined as:

A contrivance for moving people or material in or over land, water or air, having moving parts, that provides a mechanical advantage to the user, and that is powered by a living or nonliving power source. This includes but is not limited to, sailboats, hang gliders, parachutes, bicycles, game carriers, carts and wagons. It does not include wheelchairs when used as necessary medical appliances. It also does not include skis, snowshoes, rafts, canoes, sleds, travois, or similar primitive devices without moving parts (36 CFR 2320.(3)).

Nationally, there is a trend of increased outdoor recreation (White et al. 2016). Outdoor recreation and tourism are major components of the economy in the GYE. At least 5 million people visit and recreate in the National Parks and National Forests of the GYE annually (SSA p 127, U.S. Forest Service 2006, pp. 176, 184; Wilmot 2018, p. 65; Gunther 2018, p. 66). Based on past trends, visitation and recreation are expected to increase in the future. Yellowstone National Park has shown an approximate 19 percent increase in the number of people visiting each decade since the 1950s (Gunther 2018, p. 66). Because the CG Forest abuts Yellowstone National Park on two of four sides of the park and adjoins three of the five entrances to the park, visitation to Yellowstone Park has an additive influence on recreation demands on the CG Forest (U.S. Forest Service 2020).

The primary concern related to recreation is that it may increase the probability of human-grizzly bear encounters that result in disturbance to bears or an increase in human-caused mortality. During the denning season when non-motorized recreation is generally limited to skiing and snowshoeing and bears are in their dens, the potential for human-grizzly bear encounters or other disturbance is discountable.

Although non-motorized use during the non-denning season may cause disturbance to grizzly bears to varying degrees, grizzly bear mortality related to non-motorized recreation is rare and population-level impacts have not been documented (Jope 1985, pp. 34–36; McLellan and Shackleton 1989a, pp. 270–274; Kasworm and Manley 1990, p. 81, 84; White et al. 1999, p. 149). In most situations, disturbance would likely be short-term and would range from no response from a grizzly bear or temporary fleeing the area. Grizzly bears may adapt to consistent, predictable activity on trails with regular use and may notice the activity but not flee from it (KNF BO p93- Jope 1985; Mattson 2019b). On non-motorized trails that receive low amounts of human use, human activity may result in a grizzly bear temporarily fleeing from the disturbance, expending extra amounts of energy (McClellan and Shackleton 1989; Mattson 2019b).

Disturbance to bears may also be influenced by the type of non-motorized recreational activity. Due to varying skill levels and speed of travel, mountain bikers are less likely to travel in close groups and maintain verbal contact with other riders, resulting in minimizing the amount of noise and reducing the potential for early detection and avoidance by grizzly bears. Thus, mountain biking may elicit greater flight response from grizzly bears than other non-motorized use due to the higher potential for sudden encounters (Quinn and Chernoff 2010, Mattson 2019b, Herrero and Herrero 2000 *in* Servheen et al. 2017).

2. Environmental Baseline

Non-motorized recreation is largely unrestricted under the existing CG Plan except for restrictions on dispersed camping in portions of Hebgen Basin and along Gallatin Canyon designated day use areas and restrictions on mechanized use within designated wilderness.

3. Changes and Effects Inside the Recovery Zone

Relative to recreation, the CG Plan adds a new guideline for recreation events (*FW-GDL-RECEVENT 02*) that would prevent authorization of recreation events involving people traveling by foot, horse, or non-motorized mechanized use (e.g., mountain bikes) inside the recovery zone between sundown and sunrise. Combined with existing restrictions on mountain bikes in designated wilderness, restrictions on mountain biking in recommended wilderness (*FW-SUIT-RWA 02*) would limit the potential for mountain bike-bear encounters on approximately 53 percent of the area where grizzly bears occur on the CG Forest. The CG Plan also restricts mountain bikes use to approved system trails in backcountry areas and key linkage areas (*MG-SUIT-SCBCA 01*, *MG-SUIT-BHBCA 01*, *MG-SUIT-LHBCA 01*, *MG-SUIT-WPBCA 01*, *FW-SUIT-WL 01*; while mountain biking is not suitable in the Bad Canyon Backcountry Area (*SUIT-BCBCA-01*)). Limitations on recreational events between sundown and sunset increase temporal options for grizzly bears for dispersal and connectivity, while restrictions on mountain bikes reduce the potential for surprise encounters that mountain biking provides over other non-motorized recreational activities.

Although grizzly bears may experience varying degrees of disturbance as a result of non-motorized recreation, we expect effects of non-motorized recreation to grizzly bears will be insignificant. Impacts are not likely to significantly affect an individual grizzly bear's ability to breed or find food or shelter. Grizzly bears are habitat generalists and would also be able to shift their use to low disturbance areas within their home ranges.

4. Changes and Effects Outside the Recovery Zone

Similar to *FW-GDL-RECEVENT 02* that limits recreational events at night within the recovery zone, *FW-STD-WL 02* restricts recreational events at night in key linkage areas to minimize disturbance. The CG Plan also designates areas with the intent to promote various recreational opportunities but not specific types of recreation; Backcountry Areas promote semi-primitive recreation, both motorized and non-motorized depending on the area, and Recreational Emphasis Areas promote a variety of recreation opportunities in areas of high human use.

f. Vegetation Management

1. General Effects

Vegetation management includes prescribed burning, thinning, timber harvest and other activities that generally include the removal of and/or modification in the existing vegetation structure and amount of cover. This section only addresses changes to vegetation itself and does not include interrelated effects that may be a part of vegetation management projects. Depending on the type of project, vegetation management can be beneficial, neutral, or harmful to grizzly bears.

Negative effects to grizzly bears (U.S. Fish and Wildlife Service 2021, p. 129) are summarized below. However, note that effects #3 is addressed under Food and Attractive Storage and #4 is addressed under Motorized Access and Secure Habitat. These are interrelated effects and are identified here for reference.

1. Temporarily removing cover;
2. Disturbing or displacing bears from habitat during the vegetation management activity;
3. Increasing human-grizzly bear conflicts or mortalities as a result of unsecured attractants;
4. Increasing mortality risk as a result of increased human-grizzly bear encounters or displacement due to new roads into previously roadless areas and/or increased vehicular use on existing restricted roads, especially if roads remain open to the public after vegetation management is complete (McLellan and Shackleton 1988, pp. 458–459; McLellan and Shackleton 1989b, pp. 377–379; Mace *et al.* 1996, pp. 1402–1403; Schwartz *et al.* 2010a, p. 661; Boulanger and Stenhouse 2014, p. 15; Proctor *et al.* 2017, pp. 53–54; Lamb *et al.* 2018, pp. 1412–1415; Proctor *et al.* 2019, entire).

Vegetation management can also result in positive effects to grizzly bear habitat upon project completion, provided key habitats such as riparian areas and food production areas are maintained or enhanced. Positive effects to grizzly bear habitat (U.S. Fish and Wildlife Service 2021, p. 129) are summarized as:

1. Tree removal for thinning or timber harvest and prescribed burning or weed control, can result in localized increases in bear foods through increased growth of grasses, forbs, and berry-producing shrubs (Zager *et al.* 1983, p. 124; Kerns *et al.* 2004, p. 675).
2. Vegetation management may also benefit grizzly bear habitat by controlling undesirable invasive species and improving riparian management in important food production areas.

The relative importance of cover to grizzly bears was documented by Blanchard (1978) in a four-year study in the GYE. The importance of an interspersed open parks as feeding sites associated with cover is also recorded in Blanchard's study. Subsequent to the large 1998 wildfires that changed the distribution, quantity, and quality of cover, Blanchard and Knight (1996 *in* ICST 2016, p. 27) determined:

"On the average, grizzly bears used burned habitats in proportion to their availability within individual annual ranges during 1989 to 1992. Seasonal indices of movement and annual range sizes of cohorts are not statistically different from the 1975 to 1987 averages."

In a review of publications that empirically assessed grizzly bear use of recently harvested forest stands (<40 years since harvest), Colton *et al.* (2021, p.9) summarized effects as follows:

"Our review indicates that grizzly bears may frequently use forestry cut blocks if there is vegetative forage within cut blocks, especially if human activity is minimal, and natural forest openings are relatively limited. However, grizzly bear behavioural responses to cut blocks are variable in space and time, depending on cut block conditions and season, thus not all cut blocks represent comparable habitat for grizzly bears."

2. Environmental Baseline

Vegetation management activities in the form of prescribed burning, thinning, timber harvest and other activities that modify the existing vegetative composition and structure currently occur on the CG Forest. Relative to timber harvest within the grizzly bear action area, 11 percent of the area within the recovery zone and 17 percent outside the recovery zone is currently considered suitable for timber production and harvest.

3. Proposed Changes and Effects Inside and Outside the Recovery Zone

Prescribed burning, thinning, timber harvest and other vegetation management projects would continue to occur under the CG Plan. Relative to fire management, the CG Plan contains desired conditions for wildland fires that burn within a natural range of severity and frequency that allows ecosystems to function in a resilient and sustainable manner, and vegetation conditions that support natural fire regimes (*FW-DC-FIRE 01, 02*). Table 15 of the draft CG Plan (U.S. Forest Service 2021, p. 47) provides existing and desired conditions for average amount and severity of wildland fire per decade within fire regime groups. Minimum impact suppression tactics are recommended to minimize natural resource damage (*FW-GDL-FIRE 03*). Relative to values at risk, *FW-GDL-FIRE 02* allows hazardous fuel reduction projects to change the natural structure and function of vegetation that could reduce food sources for grizzly bears (e.g., berry producing shrubs).

The 2012 National Forest System Land Management Planning rule (36 CFR § 219.11) requires identification of lands that are suited and not suited for timber production. Timber production is defined as the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. Active vegetation management and some regular flow of timber products is expected to occur on land within areas identified for timber production. The CG Plan reduces the amount of land suitable for timber production inside and outside the recovery zone compared to existing management plans (Table III-10).

Table III-10. Percent land within the grizzly bear action area currently suitable for timber production and percent suitable under the CG Plan.

<i>Location</i>	<i>Existing Plan (%)</i>	<i>CG Plan (%)</i>
Inside Recovery Zone	11	9
Outside Recovery Zone	17	14
Total Area	14	12

Programmatic direction for vegetation management under the CG Plan has the potential to beneficially or adversely affect grizzly bears depending on the location, extent, existing habitat conditions, and management actions of each individual projects. These effects will be analyzed during project-specific consultation.

g. Habitat Fragmentation/Connectivity

1. General Effects

Habitat fragmentation can cause loss of connectivity and may be caused by human-caused mortality (e.g., automobile collisions and management removals) and human activities, such as habitat modification, road building, and human developments and settlement (Proctor et al. 2012, p. 23; Lamb et al. 2017, p. 62). Because grizzly bears live at relatively low population densities, disperse slowly, and are vulnerable to human-caused mortality, anthropogenic habitat fragmentation may influence grizzly bear populations that occur in close proximity to human

population centers and continuous linear rural development associated with highways (Forman and Alexander 1998, pp. 222–223; Proctor et al. 2012, pp. 23–28, 35; Lindenmayer and Fischer 2006, entire). In general, habitat fragmentation and isolation can increase vulnerability to threats, such as decreased demographic or genetic connectivity.

Males and females have different susceptibility to habitat fragmentation as females are more easily fragmented than males for several reasons (Proctor et al. 2005, p. 2414; Proctor et al. 2012, p. 23). Female dispersal is gradual (McLellan and Hovey 2001, p. 843), usually significantly shorter than males (McLellan and Hovey 2001, p. 841; Proctor et al. 2004, p. 1113), and holds the potential for small population augmentation and/or demographic rescue through their ability to bear offspring post-immigration into small, isolated populations. For these reasons, females tend to be the focus of demographic fragmentation/connectivity goals (Proctor et al. 2005, p. 2414; Proctor et al. 2012, pp. 26–27). In addition, dispersal patterns suggest that to enhance or re-establish female connectivity, female occupancy of linkage areas is necessary to facilitate inter-generational connectivity (McLellan and Hovey 2001, p. 843; Proctor et al. 2005, p. 2414; Proctor et al. 2015, p. 8; Proctor et al. 2018, pp. 363–364). Long distance dispersal distance by males enables immigrants to act as a counter to genetic fragmentation and loss of nuclear genetic diversity (e.g., GYE) (Proctor et al. 2012, p. 27; Peck et al. 2017, p. 15).

For the purposes of this biological opinion, habitat fragmentation refers to intra-ecosystem factors that limit movement of grizzly bears while habitat connectivity refers to inter-ecosystem movements that influence movement and genetic exchange between ecosystems. As previously identified (Figure III-1), the majority of the action area is located within the DMA or recovery zone of the GYE where grizzly bears “may be present”. However, one BAU of the BBC Geographic Area is located in zone 2 of the NCDE where management intent is to provide the opportunity for movement between the GYE and NCDE, and one BAU is located in zone 3 of the NCDE that is not considered to provide habitat linkage to other grizzly bear ecosystems. Relative to the juxtaposition of the CG Forest within both the GYE and NCDE, inter-ecosystem connectivity is between the GYE and NCDE ecosystems.

2. Environmental Baseline

The importance of minimizing habitat fragmentation and facilitating habitat connectivity between ecosystems has been evolving since grizzly bears were first listed under the Act. The 1982 Recovery Plan for grizzly bears did not address habitat fragmentation or habitat connectivity between ecosystems for grizzly bears. Based on observations of grizzly bears outside the GYE and NCDE recovery zones, Picton (1986) identified possible connectivity between the recovery zones in 1986. The 1993 revised Recovery Plan identified the need to “*Conduct research on the effects of habitat fragmentation caused by human activities in order to assess the possibility of linkage between grizzly bear ecosystems and between habitat tracts*” but did not provide specific requirements towards achieving this goal (U.S. Fish and Wildlife Service 1993). The 2016 Conservation Strategy further identifies the importance of providing for the movement and dispersal of grizzly bears within (intra-ecosystem) and between (inter-ecosystem) ecosystems but also does not identify methods for achieving this goal other than mitigating effects of road construction in areas considered important for habitat linkage. Using GPS locations of male grizzly bears to generate conductance layers using ecological, physical, and anthropogenic landscape features and a randomized shortest path algorithm to estimate movement between the occupied range of the GYE and NCDE, Peck et al. (2017) identified potential movement routes between the ecosystems (Figure III-7). However, due to the evolving

science and recognition of the importance of this topic subsequent to enactment of management direction under the existing Forest Plans, specific metrics and locations defining baseline condition of habitat fragmentation and connectivity have not been finalized.

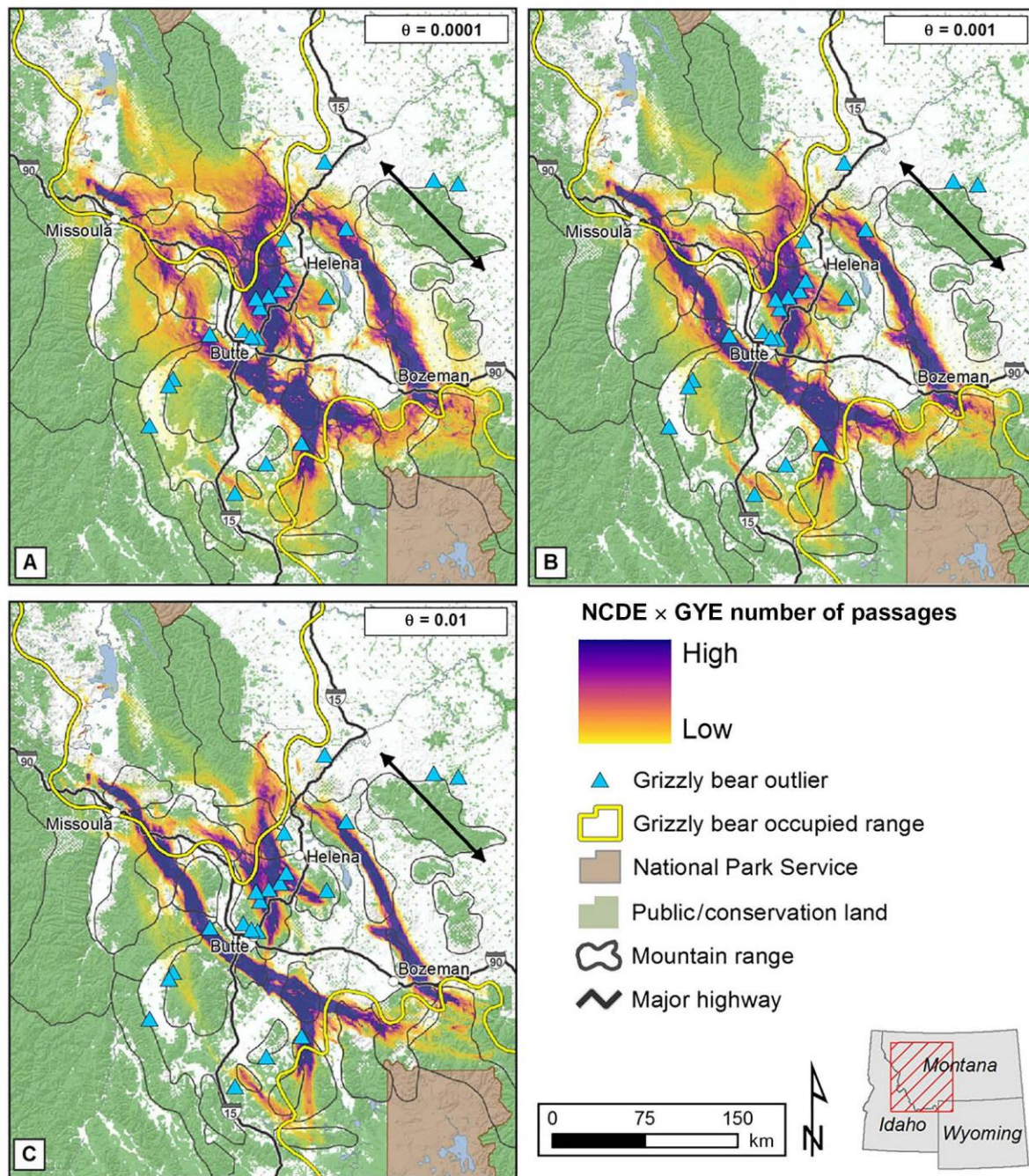


Figure III-7. Intersect of randomized shortest path predictions of male grizzly bear movements between the NCDE and GYE for three levels of random deviation (θ) representing different trade-offs between exploration and optimal exploitation of the landscape (Peck et al. 2017; Figure 4).

3. Changes and Effects of the Action

For the CG Forest that spans the GYE and NCDE, habitat fragmentation/connectivity is addressed at the scale of the action area to facilitate movement between ecosystems rather than separate aspects inside and outside the recovery zone.

Habitat Fragmentation

The grizzly bear population within the GYE is currently a contiguous population across its range, with no data indicating habitat fragmentation within this population is occurring (U.S. Fish and Wildlife Service 2021). Potential effects of the six stressors identified in the SSA that could reduce or fragment grizzly bear habitat and reduce intra-ecosystem movement (Motorized Access Management, Developed Sites, Livestock Allotments, Mineral and Energy Development, Recreation, and Vegetation Management) were addressed in their corresponding sections above (see table III-1 for crosswalk) and are not expected to fragment habitat within the GYE. Additional direction under the CG Plan minimizing habitat fragmentation is provided in *FW-GDL-VEGNF-03*:

To minimize habitat fragmentation, where there are other options for siting a facility, choose the habitat that is already more fragmented or locate development at the edge of intact areas.

Based on existing conditions and management direction provided by the CG Plan, effects of the CG Plan to habitat fragmentation would be insignificant.

Habitat Connectivity

The CG Plan specifically addresses and improves habitat connectivity to facilitate inter-ecosystem movements and genetic exchange of grizzly bears between the GYE and NCDE. However, connectivity is complicated by the juxtaposition of private and CG Forest lands; the CG Forest contains land within the GYE and NCDE but roads and development on private land along the Interstate 90 corridor bisect CG Forest land at the boundary between these ecosystems (Figure III-1). Elements of the CG Plan are intended to improve inter-ecosystem movements for grizzly bears by increasing connectivity of secure habitat through both private and CG Forest land.

To the south of Interstate 90, the Gallatin Crest Recommended Wilderness Area provides secure habitat extending north from Yellowstone National Park and the recovery zone towards the NCDE. At the northern end of the Gallatin Crest Recommended Wilderness Area, designation of the West Pine Backcountry Area improves habitat security through standard *MG-STD-WPBCA 01* that does not allow construction of new or temporary roads and *MG-STD-WPBCA 02* that does not allow authorization of new recreation events. Inventoried Roadless Areas, including land within the Bozeman Creek Watershed that provides drinking water for the city of Bozeman extend the amount of secure to the west of the West Pine Backcountry Area. Similarly, standard *BC-STD-BPBCA 01* does not allow new permanent or temporary roads in the Blacktail Peak Backcountry Area at the northern extent of CG Forest Land in the NCDE. Extending north from the West Pine Backcountry Area and south from the Blacktail Peak Backcountry Area to the intersection of CG Forest and private lands along the Interstate 90 corridor, the CG Plan designates “key linkage” areas. Figure III-8 provides the juxtaposition of

ley linkage areas and other land designation to facilitate connectivity between the GYE recovery zone and zone 2 of the NCDE.

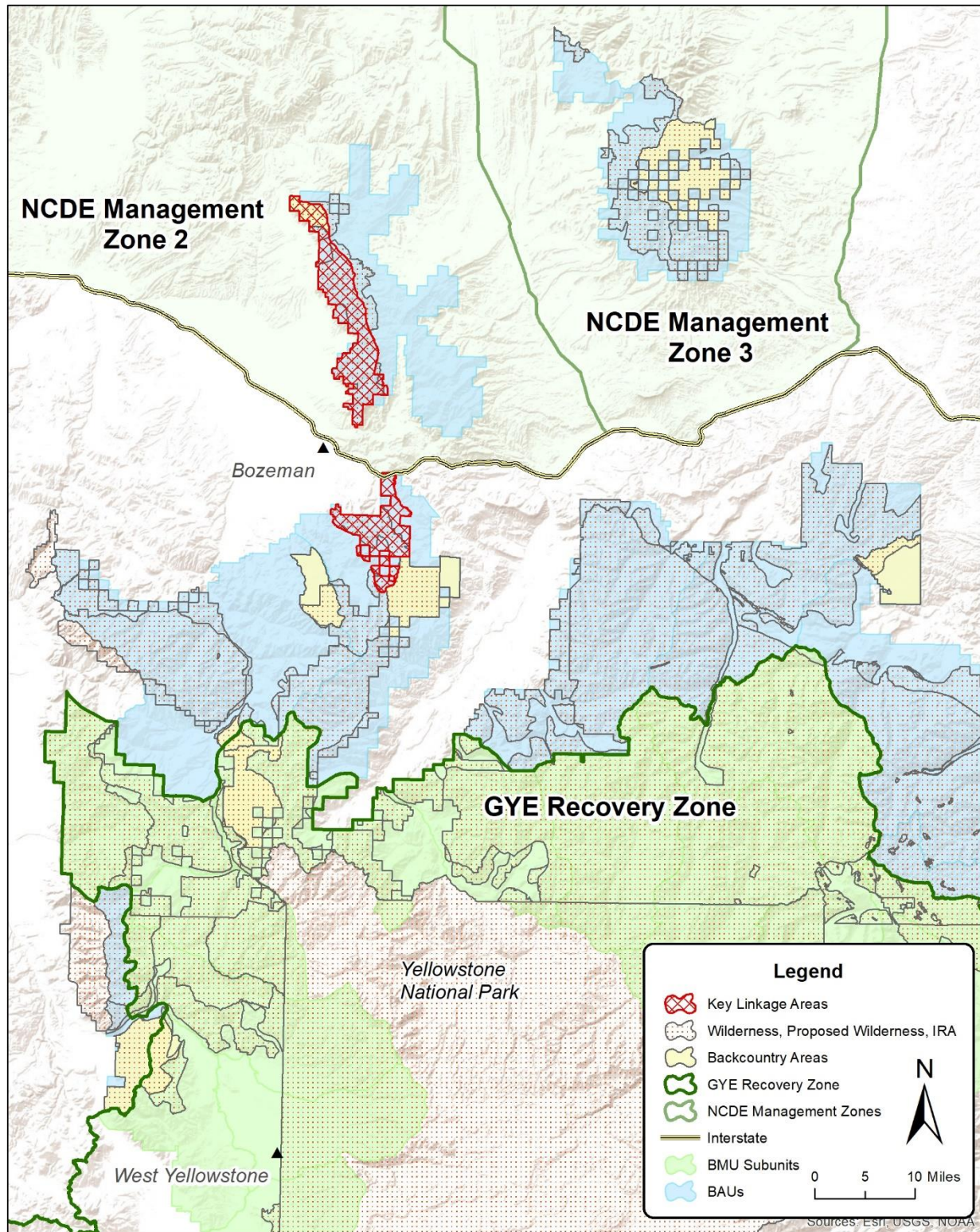


Figure III-8. Key linkage areas and other land designations contributing to connectivity between the GYE and NCDE recovery zones.

The following plan elements promote dispersal and movement through and within key linkage areas:

FW-GDL-WL 02: To protect long distance movements and range shifts for wide ranging wildlife species, vegetation management activities in key linkage areas should include design features to restore, maintain or enhance habitat connectivity.

FW-GDL-WL 03: To maintain wildlife habitat connectivity, new recreation development designed for the purpose of increasing recreation use should not be allowed within key linkage areas. New recreation developments may be allowed to address on-going or imminent ecological resource concerns within the key linkage area, including but not limited to, degradation of wildlife habitat connectivity.

FW-GDL-WL 04: To limit habitat alternations that could impede long range movement to wide-ranging species, new permanent facilities or structures and relocation of existing facilities within key linkage areas should be designed and located so that wildlife movement patterns are not permanently disrupted.

FW-GDL-WL 05: To maintain habitat quality and limit disturbance effects on wildlife movement patterns, key linkage areas should be free of sustained substantial disturbance for at least four years out of every 10-year period, including at least two consecutive years of no sustained substantial disturbance. Sustained substantial disturbance is the use of heavy equipment or low-level helicopter flights for vegetation management activities for a total of more than 30 days throughout the collective key linkage areas in a calendar year.

FW-STD-WL 02: Recreation events that take place at night shall not be authorized in key linkage areas.

The CG Plan does not provide management direction outside the Forest boundary but has included the following plan elements to promote partnerships with other agencies and landowners to specifically improve connectivity for grizzly bears between the GYE and NCDE, including the I90 corridor between these key linkage areas:

FW-GO-WLGB 01: The Custer Gallatin National Forest works with Tribal, Federal, State, and other willing partners to address the issue of habitat connectivity between grizzly bear ecosystems, with the long-term goal of achieving successful dispersal of grizzly bears between ecosystems, and ultimately increasing the genetic diversity and long-term health of grizzly bears inhabiting the Custer Gallatin National Forest.

FW-GO-RT 03: The Custer Gallatin National Forest cooperates with Tribes, highway managers, state agencies, and landowners to implement wildlife and aquatic organism crossings that reduces encounters.

Combined, land designation and plan elements of the CG Plan improve connectivity of secure habitat for the dispersal and movements of grizzly bears that is a major step forward in addressing and providing connectivity of grizzly bears between the GYE and NCDE.

h. Food Resources

1. General Effects

Grizzly bear diets are characterized by high variability among individuals, seasons, and years (Servheen 1981, p. 119–123, 127–128; LeFranc et al. 1987, pp. 24–25; Mattson et al. 1991a, pp. 1621–1625; Mattson et al. 1991b, pp. 2433–2434; Schwartz et al. 2003a, pp. 568–569; Felicetti et al. 2004, pp. 496–499; Gunther et al. 2014, pp. 64–69). They display variability in their diets and switch food habits according to which foods are most nutritious and available (Servheen 1981, pp. 119–123, 127–128; Kendall 1986, pp. 12–18; Mace and Jonkel 1986, entire; Martinka and Kendall 1986, pp. 21–22; LeFranc et al. 1987, pp. 24–25; Aune and Kasworm 1989, pp. 64–72; Schwartz et al. 2003a, pp. 568–569; Gunther et al. 2014, pp. 65–69). Grizzly bears are omnivores, and in many areas almost entirely herbivorous (Kendall 1986, p. 12; Jacoby et al. 1999, pp. 924–927; Schwartz et al. 2003a, pp. 568–569; Teisberg et al. 2015, pp. 10–12). They will consume almost any food available, including living or dead mammals and fish, insects, worms, plants, human-related foods, and garbage (Mattson et al. 1991a, pp. 1621–1622; Mattson et al. 1991b, pp. 2433–2434; Schwartz et al. 2003, pp. 568–569; Gunther et al. 2014; entire). In areas where animal matter is less available, berries, grasses, roots, bulbs, tubers, seeds, and fungi are important in meeting protein and caloric requirements (LeFranc et al. 1987, pp. 24–25; Schwartz et al. 2003a, pp. 568–569; Gunther et al. 2014, p. 65). It is hypothesized that grizzly bears frequently sample new foods in small quantities, so they have options in years when preferred foods are scarce (Mattson et al. 1991, p. 1625). Annual changes in feeding strategy have been documented in GYE grizzly bears (Mattson et al. 1991a, entire). Overall, bears seek to balance protein and carbohydrate intake over the non-denning seasons to provide the essential nutrients for growth, reproduction, and survival through the denning period (Robbins et al. 2007 pp. 1680–1681; Costello et al. 2016a, p. 19).

2. Environmental Baseline

A comprehensive study of diets in the GYE documented over 266 distinct plant and animal species ranging from grasses, fungi, berries, and seeds, to fish, carrion, and other meat sources (Gunther et al. 2014, entire). Therefore, IGBST's current monitoring efforts have focused on four foods with relatively high energetic value and for which abundance (or use by bears) is relatively easy to measure: ungulates, spawning cutthroat trout, army cutworm moths, and whitebark pine seeds (Mealey 1975, pp. 84–86; Pritchard and Robbins 1990, p. 1647; Craighead et al. 1995, pp. 247–252). In the GYE, significant use of spawning cutthroat trout only occurs inside Yellowstone National Park and use of army cutworm moths occurs in relatively small aggregation sites found in the Wyoming portion of the ecosystem (van Manen et al. 2019). Ungulates and Whitebark pine seeds are the only two of these four food sources that occur on the CG Forest.

Grizzly bears consume ungulates as winter-killed carrion in the early spring, kill calves opportunistically, consume hunter-killed carcasses or gut piles, and prey upon adults weakened during the fall breeding season. Although bison and elk are the primary ungulate species consumed by grizzly bears in the GYE, they also feed on mule deer, moose, pronghorn, and pronghorn sheep (U.S. Fish and Wildlife Service 2021).

Whitebark pine is a masting species, producing large seed crops in some years and poor crops in other years. In the GYE, a good seed crop occurs approximately every two to three years. During years of low availability of Whitebark pine seeds, human-grizzly bear conflicts tend to

increase as bears use lower elevations for foraging that tend to be within less secure habitats (Gunther et al. 2004, pp. 13–15; Schwartz et al. 2010a, pp. 661–662). Approximately six more independent females and six more independent males die across the ecosystem in poor versus good Whitebark pine years (IGBST 2013, p. 25, figure 5). These mortalities are primarily due to defense of life encounters and management removals of conflict bears (Gunther et al. 2004, pp. 13–14; IGBST 2009, p. 4). Litter size and the likelihood of producing a litter may also decrease slightly in years following poor Whitebark pine crops (Schwartz et al. 2006b, p. 21).

3. Changes and Effects of the Action

Direction in the CG Plan provides cover and protects winter range, reproductive areas, and secure habitat for ungulates (*FW-GDL-WLBG 01-03*). Combined with plan components providing ecological integrity of terrestrial vegetation, the CG Plan is expected to support the current large elk herds as well as moose and deer that all contribute to ungulate prey and carrion availability for grizzly bears.

A change in the CG Plan is the recognition of the role and contributions of bison on the CG Forest, with the inclusion of specific direction aimed at expanding the spatial and temporal presence of bison. CG Forest land in the recovery zone was selected as the area to focus bison management because there is adequate habitat to support a year-round self-sustaining bison population, it is an established recognizable boundary, it includes current bison management areas, and contains most of the CG Forest lands within the estimated pre-European settlement distribution of Yellowstone bison (White et al. 2015). Conservative forage production and allocation parameters estimated that potential bison habitat within the grizzly recovery zone could support approximately 1,308 bison per year (U.S. Forest Service 2020).

CG Plan components include a desired condition for a year-round, self-sustaining population of bison on the Forest in conjunction with the bison herds in Yellowstone National Park (*FW-DC – WLBI 04*), a guideline to limit management-related impediments to bison movement (*FW-GDL-WLBI 03*), expansion of strategic bison habitat improvement projects (*FW-GDL-WLBI 02*), and encouragement to resolve bison-livestock conflicts in favor of bison (*FW-GDL-WLBI 01*). Expanding bison presence on the CG Forest would subsequently increase the availability of ungulate biomass for grizzly bears.

The CG Plan also contains components intended to protect, restore, and ultimately increase the presence of Whitebark pine (*FW-DC-PRISK 02*, *FW-GO-PRISK 01*, *FW-OBJ-PRISK 02* and *FW-GDL-PRISK 02*). These components provide clear and specific management direction to maintain or increase Whitebark pine across the landscape, rather than just inside the recovery zone. Management direction under the CG Plan would contribute to greater Whitebark seed production and contribute toward long-term persistence of this key food source inside outside the recovery zone.

Additional intent of the CG Plan is to provide ecological integrity by managing vegetation within the natural range of variation and for long-term resiliency. Desired conditions, standards and guidelines pertaining to composition, structure, and landscape pattern of vegetation would maintain the many vegetative food sources utilized by grizzly bears.

i. Land Designation and Plan Land Allocation

1. General Effects

Under the CG Plan, a designated area is defined as an area or feature identified and managed to maintain its unique special character or purpose (U.S. Forest Service 2021, p. 108). Designated

areas may be designated by statute (e.g., designated wilderness areas, inventoried roadless areas, and wilderness study areas) and some may be established administratively (e.g., research natural areas, scenic byways, and special areas with unique values). Areas defined by “plan land allocations” are management areas developed in the planning process. For the CG Plan, plan land allocations include recreation emphasis areas, backcountry areas, and the Stillwater Complex, among others. More than one designation or allocation may be assigned to a particular place. For example, a backcountry area and inventoried roadless area may coincide, but where allocations overlap, the more restrictive guidance applies.

2. Environmental Baseline, Changes to Land Designations, and Effects of the Action

Land designation or allocation that provide restrictions to maintain or conserve high-quality grizzly bear habitat are considered a conservation effort (U.S. Fish and Wildlife Service 2021). Examples include designations that restrict motorized access and/or developed sites, maintain secure habitat, and protect high-quality food resources. Table III-10 indicates the existing percent of the area by land designation type inside and outside the recovery zone that contains restrictions to maintain or conserve high-quality grizzly bear habitat.

Table III-11 indicates the percent of the area by land designation type inside and outside the recovery zone under the CG Plan that contains restrictions to maintain or conserve high-quality grizzly bear habitat. Included in table III-11 are the designations of Backcountry Areas and Key Linkage Areas, as well as Recommended Wilderness Areas. Although plan components are unique to the desired character of each backcountry area, they are included in Table III-11 because all backcountry areas within the grizzly bear action area contain restrictions to limit motorized access. Key linkage areas are included for restrictions that would maintain the potential for dispersal and movement through the areas that provides connectivity between the GYE and NCDE.

Inside the recovery zone, the CG Plan reallocates land designations among categories and adds a few thousand acres with additional restrictions, but does not change the total percent. Outside the recovery zone, the CG Plan would increase the amount of land with restrictions by almost 30,000 acres, from approximately 79 percent to approximately 81 percent (Tables III-10 and III-11). Other land designations under the CG Plan (e.g., recreation emphasis areas and the Stillwater Complex) identify unique opportunities or uses within those areas but do not specifically authorize or fund infrastructure or actions that may affect grizzly bears. Any actions affecting grizzly bears within areas of those land designations and all other land designations/allocations will undergo site-specific consultation on the effects of those actions to grizzly bears.

Table III-10. Existing land designation providing protections to grizzly bear habitat.

<i>Land Designation</i>	<i>Inside Recovery Zone (%)</i>	<i>Outside Recovery Zone (%)</i>	<i>Total (%)</i>
Designated Wilderness	54	0	48
Wilderness Study Area	6	0	7
Inventoried Roadless	22	0	23
Recommended Wilderness	1	0	1
Totals	82	77	79

Table III-11. Land designation providing protections to grizzly bear habitat under the CG Plan.

<i>Land Designation</i>	<i>Inside Recovery Zone (%)</i>	<i>Outside Recovery Zone (%)</i>	<i>Total (%)</i>
Designated Wilderness	54	44	48
Wilderness Study Area	<1	2	1
Inventoried Roadless	20	22	21
Recommended Wilderness	5	4	5
Backcountry Areas	3	7	5
Key Linkage Areas	0	<1	<1
Totals	82	79	81

j. Food and Attractant Storage

1. General Effects

Improperly stored food, garbage, and/or livestock or pet foods can lure grizzly bears to areas near people and pose a significant risk of habituating bears to human presence and/or conditioning grizzly bears to seek out anthropogenic foods and attractants. Food conditioned grizzly bears enter unsecured garbage receptacles, sheds, and other buildings in search of a reward. Accessibility to human related attractants and conditioning to those rewards can lead to management removal of grizzly bears and additionally, mortality of grizzly bears by people defending their life and property.

2. Environmental Baseline and Effects of Food and Attractant Storage

A Special Order requiring the proper storage of food and attractants has been in place on the Forest within the recovery zone since the mid-1980s. The Food Storage Order was expanded and updated in 2014 to cover the entire montane ecosystem of the Forest. The revised plan contains desired conditions for human-related attractants to be unavailable to all wildlife, for natural foraging patterns to be the norm, and for food conditioning, habituation of animals and associated wildlife conflicts to be minimal (*FW-DC-WL 08*). Plan components *FW-DC-WL 08* and *FW-STD-WL 01* ensure the food storage order remains in place for the entire grizzly bear

action area. Food and attractants include human food, pet food, livestock feed, scented personal hygiene products, and animal carcasses of domestic livestock or human-killed fish and wildlife. Food storage restrictions require that all such substances, when not attended, must be acceptably stored, by a variety of means, so that they are made unavailable to bears. In the case of animal carcasses, these attractants must be acceptably stored or an acceptable distance from camping/sleeping areas and Forest System trails. Plan components effectively minimize the potential for grizzly bears to get into food-related conflicts with humans.

k. Information, Education, and Enforcement

1. General Effects

Sources of human-caused mortality to grizzly bears can be reduced if adequate information and education programs are provided to people who live, work, and recreate in occupied grizzly bear habitat and if proper management infrastructure is in place (Linnell et al. 2001, p. 345). In Montana and throughout the GYE, information and education programs have contributed to a reduction in the number of bears obtaining anthropogenic foods, thereby reducing the need for management actions involving capture, relocation, or sometimes removal (Frey and Smith *in van Manen et al. 2019*).

2. Environmental Baseline and Effects of Information, Education, and Enforcement

The CG Forest is a founding and active member of the Montana Bear Education Working Group. The purpose of this group is a coordinated effort to better inform the public regarding how to be safe in bear country, reduce conflicts, and in doing so increase tolerance for bears. Educational materials and communication strategies are developed and reviewed by the working group which also provides oversight to ensure technical correctness and consistency of messaging across the ecosystem. In support of this effort the CG Forest provides seasonal bear aware technicians who patrol for violations and educate public land users on proper bear awareness. Since 2016 the CG Forest had installed approximately 400 bear-proof food storage boxes at campsites through a partnership between Forest Service and the Greater Yellowstone Coalition.

In addition to the current involvement by the CG Forest in information and education programs, *FW-DC-REA 04* for recreational users includes the availability of educational programs to reduce wildlife-human conflicts. Desired conditions (*FW-DC-WLGB 03*) on the Forest call for the availability of bear awareness information and that there are few bear-human conflicts. Effects of these conservation efforts by the Forest would continue to help minimize conflicts and mortality to bears from removal actions resulting from conflicts.

1. Monitoring Program

The CG Plan also includes a monitoring program in accordance with the 2012 planning rule (36 CFR 219.12(a1)). Monitoring information should enable the CG Forest to determine if a change in plan components or other plan content that guide management of resources for the plan area may be needed. Each plan monitoring program must contain one or more monitoring questions and associated indicators and measures addressing the status of a select set of the ecological conditions required under §219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern (36 CFR 219.12(a)(5)(iv)). Monitoring questions and metrics must be designed to inform the management of resources for the plan area, including

testing relevant assumptions, tracking relevant changes, and measuring management effectiveness and progress toward achieving or maintaining the plan's desired conditions or objectives.

The CG Plan contains the following two monitoring questions relevant to grizzly bears inside and outside the recovery zone (U.S. Forest Service 2021);

MON-WL-10: To what extent are management actions changing grizzly bear habitat inside the recovery zone, relative to the 1998 baseline or 2006 baseline where applicable?

MON-WL-11: To what extent are management actions changing secure habitat and associated habitat connectivity outside the recovery zone?

Inside the recovery zone, *MON-WL-10* uses secure habitat, OMARD, TMARD, changes in number and capacity of developed sites, and number and acreage of livestock allotments to address changes in grizzly bear habitat due to management actions. Outside the recovery zone, *MON-WL-11* uses changes in secure habitat to address effects of management actions on secure habitat and connectivity for grizzly bears. Combined, these two monitoring questions provide a measure of ecological conditions throughout the grizzly bear action area using the three important habitat criteria appended to the grizzly bear recovery plan (U.S. Fish and Wildlife Service 2007 - supplement).

III.A.7 Effects Summary

This biological opinion addressed the 15 stressors and seven conservation efforts identified in the SSA (U.S. Fish and Wildlife Service 2021). Rather than addressing each stressor and conservation effort individually, we cross-walked them into the sections of this biological opinion (Table III-1) in order to provide a more succinct analysis within the framework of section 7 consultation. These reasons include; (1) the interrelationship among many stressors (e.g., “motorized access” is an integral part of other stressors such as “vegetation management” and motorized aspects of “recreation”), (2) some stressors, such as “development on private land”, is not affected by the proposed action and is part of cumulative effects during section 7 consultation, and (3) “secure habitat” is not identified in the SSA as a stressor in itself, but is a metric that has long-been used to analyze effects of “motorized access”, its use has been expanded to include effects of “developed sites on federal lands” under the CG Plan, and is one of the three metrics with standards applicable to federal lands identified in the 2003, 2007, and 2016 Conservation Strategies. Effects of the CG Plan to these stressors and conservation efforts, as cross-walked in Table III-1, are briefly summarized below, followed by a summary of effects to grizzly bears.

Motorized Access

Management direction of motorized access routes, including the designation of open motorized access routes, restricted routes, and existing routes designated for closure remains under the direction of the Gallatin National Forest Travel Plan and the Beartooth Travel Management Plan. Implementation of both travel plans is ongoing. The amount of secure habitat, OMARD, and TMARD are all important metrics for assessing the effects of motorized access to grizzly bears. Under management direction of the Gallatin National Forest Travel Plan within the recovery zone, motorized access would not reduce secure habitat below 1998 baseline levels or increase

the percent of OMARD greater than 1.0 mile/mile² and the percent of TMARD greater than 2.0 miles/mile² above 1998 baseline levels. These standards remain in effect under the CG Plan.

Outside the recovery zone, the CG Forest provided calculations of secure habitat and proposed reductions in secure habitat over the life of the CG Plan resulting from potential increases in permanent and temporary roads for all BAUs on the CG Forest. Calculations of secure habitat included five BAUs not considered during travel planning consultation. Reductions in secure habitat over the life of the CG Plan was a revised metric from the miles new roads that was used during the 2006 and 2013 travel planning consultations. Secure habitat in all BAUs outside the recovery zone and the revised metric for reductions were included in our analysis of effects for motorized access and secure habitat (below). However, monitoring and reporting requirements for effectiveness of road closures included during consultation for travel planning does not include the five BAUs outside the action area of the Gallatin National Forest Travel Plan.

Developed Sites on Federal Land

The CG Plan provides the following changes and effects to existing management direction of developed sites on federal lands:

1. The footprint approach delineating the spatial extent of major developed sites provides a more accurate indication of the area of human activity than the previous use of a “point” to designate major developed sites.
2. Infill of new infrastructure within footprints of major developed sites would not increase the spatial extent of these sites or result in loss of habitat, but could result in increased human presence and human-grizzly bear interactions in surrounding areas or backcountry trails.
3. Additional infrastructure could occur within 300 meters of primary roads in the recovery zone but would be for day-use only, within areas of generally high disturbance along major highways, and be outside high quality habitat.
4. A 10 percent increase in added capacity at the two existing resorts operating under special use permits on the CG Forest could increase capacity by 2-3 overnight accommodations at one and up to 30 at the other, but would be within the existing footprint of the sites.
5. Consolidation of dispersed campsites into four potentially new developed campgrounds with a commensurate closing of dispersed campsites would reduce disturbance that currently exists where dispersed camping is allowed, would not increase the total number of campsites on the CG Forest, and would provide better enforcement of food and attractant orders that reduce human-grizzly bear encounters. Based on the current number (177), the four additional campgrounds would also not exceed the 1998 baseline number of developed sites (183).

Secure Habitat

Inclusion of the footprint approach to define 1998 baseline and current areas of human activity in calculations of secure habitat for the recovery zone provides a more accurate estimate of secure habitat than the previous method using only motorized access routes. The slight reductions in 1998 baseline levels of secure habitat using this method (Table III-5) are based on an improved

metric rather than changes affecting actual amounts of secure habitat available to grizzly bears. Therefore, inclusion of the footprint for developed sites in calculations of secure habitat does not change existing standards or effects of major developed sites.

Use of the 10 acre minimum patch size for calculating secure habitat has been used since 2003 and provides a more sensitive metric to change than a larger patch size. Existing land designations restricting roads and developed sites (e.g., designated wilderness, inventoried roadless areas) currently provide large blocks of secure habitat and the increase in area of designated land with these restrictions under the CG Plan (Table III-11 and Figure III-6) increase the availability of large patches of secure habitat.

Livestock Allotments

The current number and acreage of livestock allotments in the recovery zone is currently less than 1998 baseline levels (Table III-8). Although the number and acreage of livestock allotments may increase over existing levels during the lifetime of the CG Plan, the Plan maintains all existing standards to keep livestock allotments within 1998 baseline levels.

Recreation

The CG Plan provides additional restrictions on non-motorized recreational events (e.g., races and endurance events) between sundown and sunset within the recovery zone and locations considered key linkage areas to minimize nighttime disturbance.

Vegetation Management

Vegetation management activities will continue under the CG Plan, but the amount of land considered suitable for timber production has been reduced over current levels (Table III-10).

Habitat Fragmentation/Connectivity

Designation of key linkage areas, other land designations restricting motorized access, plan elements restricting management activities within key linkage areas, and Plan goals to work cooperatively with other partners to improve connectivity on non-federal lands provides a significant improvement in providing connectivity between the GYE and NCDE.

Food Resources

CG Plan components to maintain ungulate habitat and a desired condition for a year-round self-sustaining population of bison on the CG Forest will maintain or improve the availability of winter-killed ungulates and the potential to prey on calves in the spring and weakened adults during the breeding season. Plan components to protect and restore Whitebark pine and other specialized habitat (e.g., riparian areas) maintain important vegetative food sources.

Conservation Efforts

Land Designation, Food and Attractant Storage, and Information, Education, and Enforcement are all considered conservation efforts in the SSA. As previously described, land designation under the CG Plan would improve connectivity, increase large patches of secure habitat, and reduce motorized access. Food and attractant storage has been in place since the mid-1980s in the recovery zone, was expanded throughout the action area in 2014, and will remain unchanged

by the CG Plan. The CG Forest has been active in information and education programs and will remain so under the CG Plan.

Cumulative Effects

The stressors Development on Private Land, Sources of Human-caused Mortality, Natural Mortality, and Catastrophic Events are unrelated to the CG Plan and addressed in the Cumulative Effects section.

Effects to Grizzly Bears

Grizzly bears are generally expanding their range throughout the GYE. They are currently not considered as “may be present” within the Pryor Mountains Geographic Area and the Bridger, Bangtail and Crazy Mountains Geographic Areas. Consultation on projects in these GAs is therefore not required. However, grizzly bears are likely to occur in these areas during the life of the CG Plan and the analysis provided in the biological assessment (U.S. Forest Service 2020) and this biological opinion address effects of the CG Plan across the entire action area identified in section III.A.

Initial occurrence in the Pryor Mountains Geographic Area and the Bridger, Bangtail and Crazy Mountains Geographic Areas will likely be by dispersing males and subadults that are highly mobile, are not restricted to finding food and shelter within a home range, and do not have the same energetic needs as adult females. Although human disturbance may affect behavioral patterns such as feeding or sheltering of all grizzly bears, we do not anticipate such effects would cause harm or significant impairment to behavioral patterns of dispersing subadult or adult male grizzly bears that we anticipate would initially occur in these geographic Areas.

In reviewing the effects of the CG Plan on grizzly bears across the action area, we would expect the majority of potential adverse effects would be due to motorized access, developed sites, and to a lesser extent, livestock grazing. Effects related to these actions will depend on site-specific conditions. Not all actions proposed during the lifetime of the CG Plan that are related to these actions will result in adverse effects.

Juxtaposition of roads across the CG Forest is variable; high levels of motorized routes exist in some areas while other portions have low- or no-levels of motorized access routes. However, 1998 baseline levels related to secure habitat, OMARD, and TMARD would be maintained within the recovery zone. With a few exceptions, Forest lands within the recovery zone would be managed for no net increase above the 1998 baseline conditions. Temporary road construction and use may occur on a project by project basis that reduces secure habitat and increases road densities, but would be limited in duration of use. Outside of the recovery zone, the Forest estimated that secure habitat may be reduced by 1 percent for permanent roads and 2 percent for combined permanent and temporary roads during the life of the CG Plan. No specific actions resulting in increases in motorized routes are proposed under the CG Plan and would be analyzed on a site-specific basis.

Effects of motorized access routes include displacement from otherwise secure habitat and under-use of key feeding and sheltering habitat. Effects would be most pronounced in female grizzly bears with high energetic needs for successful reproduction and females with cubs.

Realized effects are dependent on type of habitats, duration of disturbance, availability of replacement resources, and individuality of grizzly bears.

Similar to effects of motorized access routes, effects of developed sites includes displacement from otherwise secure habitat and under-use of key feeding and sheltering habitat. However, developed sites also include the potential for human-grizzly bear encounters and acquisition of human foods and/or other attractants that may result in management removal of bears. Increases in the number of campsites at existing developed campgrounds provides the potential for more human-grizzly encounters, but is also dependent on site-specific factors.

Livestock allotments in the action area have the potential to result in adverse impacts to grizzly bears if livestock/grizzly bear conflicts occur. Grizzly bears may become food conditioned/habituated and seek out livestock as prey, which may result in the removal of grizzly bears. The likelihood of adverse impacts to grizzly bears related to livestock grazing during the life of the CG Plan is very low, given the low numbers of conflicts and management removals that have previously occurred on the CG Forest. Due to the long duration of the CG Plan and the expected increase in the number of grizzly bears using the action area, it is reasonable to expect some risk of adverse effects to grizzly bears related to livestock grazing.

The Service also anticipates that over-snow motorized vehicles may incidentally result in a very low level of adverse effects to grizzly bears. Over-snow motorized vehicles would be restricted on large proportions of denning and spring habitat on the CG Forest and thousands of acres of denning and spring habitat would be legally unavailable to over-snow motorized vehicles in the broader area where grizzly bears may occur. Where the two overlap, there is still some spatial separation, but the potential for adverse effects cannot be eliminated. The best information available indicates adverse effects are more likely to occur when grizzly bears emerge from dens than during the middle of winter.

Although the Forest's management of grizzly bear habitat may result in direct and indirect adverse effects to individual grizzly bears, we do not anticipate these effects will have appreciable negative impacts on the grizzly bear population. Grizzly bears have been expanding their range into areas with higher than optimal (for grizzly bears) human use levels and mortalities and conflicts in the action area are rare to non-existent. Much of the action area is located outside of the GYE grizzly bear recovery zone. The Recovery Plan stated that grizzly bears living within the recovery zone are crucial to recovery goals and hence to delisting. Grizzly bears inside and outside of recovery zones are listed as threatened under the Act, but only lands inside the recovery zones are managed primarily for the recovery and survival of the grizzly bear as a species. In developing the recovery zones, all areas necessary for the conservation of the grizzly bear were included.

The CG Plan is considered a framework programmatic action. It does not authorize, fund, or carry out an action but provides direction for future actions that may be authorized, funded, or carried out by the Forest. Therefore, any action subsequently authorized, funded, or carried out under the CG Plan, will be addressed in subsequent section 7 consultations, as appropriate.

This consultation represents the first tier of a tiered consultation framework, with each subsequent project that may affect the listed species and/or designated critical habitat analyzed within this programmatic biological opinion, as implemented under the CG Plan, being the

second tier of consultation. When applicable, some second tier consultations would reference back to this programmatic biological opinion to ensure that the effects of specific projects under consultation are commensurate with the effects anticipated in this biological opinion and incidental take statement.

III.A.8 Cumulative Effects

The implementing regulations for section 7 define cumulative effects as those effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Montana Fish, Wildlife and Parks (FWP) has completed a grizzly bear management plan for western Montana and southwestern Montana. These plans establish goals and strategies to manage and enhance grizzly bear populations and to minimize the potential for grizzly bear-human conflicts. A long-term goal is to allow the populations in western and southwestern Montana to reconnect through the intervening, currently unoccupied habitats. FWP is also very active in providing public information and education about conserving grizzly bears and their habitat. This includes bear management specialists, including specialists in and adjacent to the action area in Choteau, Conrad, Missoula, and Bozeman, who provide information and assistance to landowners on appropriate ways to secure food and bear attractants and respond to reports of conflicts with bears. These specialist positions have a proven track record of reducing human-caused grizzly bear mortalities.

Private lands occur within and adjacent to the action area. The human population within the action area has grown at a relatively high rate during the past few decades and growth is expected to continue. Such growth is expected to result in increased residential development of private lands within the action area and can result in habitat loss, habitat fragmentation, and increases in human-grizzly bear conflicts. Recreation, livestock grazing, ranching and farming, mineral development, and food and attractant storage issues on private land can create grizzly bear-human conflicts by providing attractants to grizzly bears. Once grizzly bears become habituated and/or associated with a grizzly bear-human conflict, they are typically removed. Human population growth could also result in additional grizzly bear attractants and further increase the potential for grizzly bear-human conflicts. As more people use private land and adjoining federal land for homes, recreation or business, the challenge to accommodate those uses in ways that continue to protect the grizzly bear population increases.

However, despite the recent growth of the human population, the grizzly bear population is increasing as well (U.S. Fish and Wildlife Service 2020). In addition, large federal land ownership (including Forest Service) and large blocks of wilderness within which human access is restricted by regulation and topography serve to reduce the impacts of larger residential human populations on grizzly bears. While federal land management cannot entirely compensate for cumulative impacts on private land, management on Forest Service lands as well as management under the CG Plan would continue to provide habitat for grizzly bears.

As described in the baseline section above, any private entity's non-compliance with the Forest's access management is an illegal activity. While future illegal motorized use of the Forest in areas unauthorized for such use may occur within the action area, such illegal use is not considered a Forest (federal) action. These, and any other illegal activities that are not the result of a federal action are not analyzed under effects of the action, but their influence is considered under potential cumulative effects. While cumulative effects to grizzly bears may occur as a result of illegal motorized access, the information as to the length, duration, amount of use, type of use, and location, among other conditions, is and will continue to be unknown until such time that illegal use is found. The probability of long-term illegal motorized access and probability of illegal access coinciding with the presence of grizzly bears is anticipated to be low but is unknown. As such, the potential consequences to grizzly bears are uncertain. Illegal motorized access is expected to be spatially disparate and temporary and is not likely to collectively cause an adverse effect because most users follow travel regulations and when illegal use is observed or when user-created roads become apparent the Forest corrects the situation as soon as they are able.

Mortality due to natural causes represents a relatively small portion of total mortality sources. Within the DMA, natural mortality was estimated to be 8 percent for independent-age bears and 11 percent for dependent young (U.S. Fish and Wildlife Service 2021). Natural causes include avalanches, injuries, killing by other bears or wildlife species, old age, and starvation. Wolves and grizzly bears often scavenge similar types of carrion and will sometimes interact with each other in an aggressive manner. Since wolves were reintroduced into the GYE in 1995, there have been 339 known wolf-grizzly bear interactions with 6 incidents in which wolf packs likely killed grizzly bear cubs-of-the-year and two incidents in which wolves likely killed adult female grizzly bears (Gunther and Smith 2004, pp. 233–236). Although grizzly bears have been documented with a variety of bacteria and other pathogens, parasites, and disease, fatalities from disease are uncommon (LeFranc et al. 1987, p. 61) and do not appear to have population-level impacts on grizzly bears (Jonkel and Cowan 1971, pp. 31– 32; Mundy and Flook 1973, p. 13; Rogers and Rogers 1976, p. 423).

In addition to human caused mortality associated with livestock allotments, mortality also occurs due to mistaken identity during the hunting season for black bears and in cases of self-defense. Grizzly bear mortality as a result of self-defense is not considered “take”, as addressed under the 4(d) rule.

Effects from catastrophic events, such as fire and earthquakes would likely be localized, temporary, and not a significant concern for grizzly bears within the GYE. Volcanic activity is a possibility in the area but unlikely during the life of the CG Plan.

III.A.9 Conclusion

The effects of the action and cumulative effects are added to the environmental baseline and in light of the status of the species and critical habitat, the Service formulates an opinion as to whether the action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. Should the federal action result in a

jeopardy situation and/or adverse modification conclusion, the Service may propose reasonable and prudent alternatives that the federal agency can take to avoid violation of section 7(a)(2).

After reviewing the current status of grizzly bears, the environmental baseline for the action area, the effects of the action, and the cumulative effects, it is the Service's biological opinion that the effects of the CG Plan on grizzly bears are not likely to jeopardize the continued existence of the grizzly bear. No critical habitat has been designated for this species; therefore, none will be affected. Implementing regulations for section 7 (50 C.F.R. § 402) define "jeopardize the continued existence of" as to "engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." Our conclusion is based on, but not limited to, the information presented in the biological assessment (U.S. Forest Service 2020), correspondence during this consultation process, information in our files, and informal discussions between the Service, the Forest, and other personnel.

The CG Plan may occasionally result in adverse effects to individual grizzly bears over the life or the plan, particularly as a consequence of the potential disturbance and/or displacement related to access management and developed sites. The likelihood of adverse impacts to individual grizzly bears related to livestock grazing in the action area during the life of the CG Plan is low but cannot be ruled out. Based on the best available scientific information reviewed in this consultation, such adverse effects will not negatively impact the recovery of the GYE grizzly bear population. Further, we expect the CG Plan direction will result in conditions that support continued grizzly bear use of the action area, especially in the recovery zone, and improve connectivity between the GYE and NCDE.

The SSA uses the conservation biology principles of resiliency, redundancy, and representation, as a lens to evaluate the current and future condition of the species (U.S. Fish and Wildlife Service 2016, p. 6). Resiliency is the ability for populations to sustain in the face of environmental and demographic stochastic events, or for populations to recover from years with low reproduction or reduced survival, and is associated with population size, growth rate, connectivity, and the quality and quantity of habitats (U.S. Fish and Wildlife Service 2021, p. 3). Currently, the GYE has high resiliency due to the generally high and moderate conditions for habitat and demographic factors (U.S. Fish and Wildlife Service 2021, p.12). Resiliency would be maintained under a scenario that upholds existing standards and protections that benefit grizzly bears within U.S. Forest Service and National Park Service land management plans. It is our biological opinion that the CG Plan maintains or improves standards that benefit grizzly bears and would, therefore, not appreciably reduce the likelihood of both the survival and recovery of grizzly bears.

III.B. INCIDENTAL TAKE STATEMENT FOR GRIZZLY BEAR

Section 9 of the Act, and Federal regulations pursuant to section 4(d) of the Act, prohibit the 'take' of Endangered and Threatened species, respectively without special exemption. *Take* is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. *Harm* is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering. *Harass* is defined by

the Service as an intentional or negligent act or omission that creates the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. *Incidental take* is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The CG Plan provides direction for future actions that may be authorized, funded, and/or carried out by the Forest, but in itself it does not mandate or approve implementation of future activities that may occur on the Forests. For the purposes of an incidental take statement, a Federal action is a framework programmatic action if it approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time, and any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further section 7 consultation (50 C.F.R. § 402.02). For a framework programmatic action such as the CG Plan, an incidental take statement may be provided but is not required at the programmatic level; any incidental take resulting from any action subsequently authorized, funded, or carried out under the program that is not addressed below will be addressed in subsequent section 7 consultation, as appropriate.

For some activities implemented under the CG Plan, the level of detail available is insufficient to identify with particularity all possible circumstances that may possibly involve the incidental take of listed species. Given the lack of site-specific specificity and information regarding future effects of actions implemented under the CG Plan, providing the amount or extent of take would be speculative and unlikely to provide an accurate and reliable trigger for reinitiation of consultation for some effects. Consequently, with the exception of incidental take related to grizzly bears as described below, other potential for incidental take that we are unable to anticipate at this time is deferred to future consultation on individual projects. Any incidental take resulting from subsequent actions that proceed under the CG will be subject to section 7 consultation, as appropriate. In addition, take that may occur due to illegal activities by private citizens within the action area is not exempted in this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the Forest so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest has a continuing duty to regulate the activity that is covered by this incidental take statement. If the Forest (1) fails to assume and implement the terms and conditions or (2) fails to require an applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Forest must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 C.F.R. § 402.14(i)(3)].

Amount or Extent of Take

Non-Denning Season Motorized Access

As previously described in this biological opinion, harm to grizzly bears may occur due to low amounts of secure habitat and locations of high road densities that displace individuals from key habitat to the extent that significant under-utilization of habitat may occur. Using the best information on the effects of motorized access on grizzly bears, we conclude that low amounts of

secure habitat and locations of high motorized route densities in portions of the action area are likely to result in a level of adverse effects to some female grizzly bears at some point during the life of the CG Plan, primarily those that attempt to establish and maintain home ranges within the action area. Future road construction, permanent or temporary, may add to or increase the likelihood of such adverse effects. The Service maintains that such under-use of otherwise suitable habitat within a grizzly bear's home range may constitute incidental take of grizzly bears through "harm" as a result of significant habitat alteration that impairs breeding, feeding and/or sheltering.

The Service anticipates that in a limited number of circumstances, site specific conditions would result in significant displacement of adult females from key seasonal habitat, impairing their ability to find adequate food resources, breed and raise young, and/or find shelter. Subsequently, harm would result from decreased fitness and impaired reproductive potential that reduces the frequency of breeding or the ability to complete gestation. The take we anticipate would result in incidental take to a low number of female grizzly bears that may inhabit the action area now and into the future, over the life of the CG Plan.

We do not anticipate any take of subadult or male grizzly bears. Male grizzly bears have larger home ranges than females, males and subadults are more mobile, and do not have the same energetic needs as adult females. We also do not anticipate take of grizzly bears that are transient (moving through areas outside of home range use) because these individuals are highly mobile and not restricted to finding food and shelter within a home range. Therefore, displacement may affect behavioral patterns such as feeding or sheltering but we do not anticipate these effects would cause injury to transient, subadult, or male grizzly bears.

Levels of motorized routes are spatially variable within and between BMU subunits inside the recovery zone and BAUs outside the recovery zone. Within the recovery zone, three subunits were determined to need improvements above the 1998 baseline standards for motorized routes, Henrys Lake #2, Gallatin #3, and Madison #2 (Yellowstone Ecosystem Subcommittee 2003) and that incidental take of grizzly bears was occurring under 1998 baseline standards.

Implementation of the Gallatin National Forest Travel Plan has increased secure habitat and reduced OMARD and TMARD in all three of these subunits to the point the Service does not consider incidental take is occurring in the Gallatin #3 subunit, but it will continue to occur in the Henrys Lake #2 and Madison #2 subunits even with full implementation of the travel plan.

Baseline levels and standards to maintain or improve levels of motorized routes are not applicable in BAUs outside the recovery zone on lands that are not considered essential for recovery of the species. However, effects of motorized routes to grizzly bears are the same as inside the recovery zone and incidental take can occur wherever grizzly bears may be present. Similar to subunits inside the recovery zone, effects in BAUs depend on the amount of existing secure habitat within a BAU, the presence of female grizzly bears, and the occurrence, length, and duration of temporary roads. Under management direction of the CG Plan, permanent reductions in secure habitat are not expected to exceed 1 percent below full travel plan implementation for any BAU, and total reductions due to new permanent and temporary motorized routes combined are not expected to exceed 2 percent below full travel plan implementation for any BAU over the life of the CG Plan. As previously discussed in this opinion, effects to grizzly bears from the potential 1 percent and 2 percent reductions in secure habitat would be insignificant.

Denning Season Motorized Access

The Service anticipates that motorized access during the denning season (over-snow motorized vehicle use) may result in a very low level of incidental take for grizzly bears in the form of harm or harass. Premature den emergence or displacement from denning areas that can result in reduced fitness of females and cubs and possibly injury or death due to disturbance from over-snow motorized vehicles may occur. However, disturbance upon post-den emergence when bears are searching for limited food sources may have the greatest effects. These effects may be most pronounced in high elevation locations that receive high amounts of snow that lasts late into the spring and extensive use of over-snow motorized vehicles exits, such as the Cooke City Recreation Special Emphasis Area.

Increase in Capacity for Overnight Use

Within the recovery zone, increases in the number of campsites within the footprints of existing developed campgrounds would likely occur under direction of the CG Plan. Although the increased capacity in overnight use would not result in loss of secure habitat or spatial expansion of the campgrounds, the additional number of people increases the potential for interactions with grizzly bears and increased attractants that may result in management removals (mortality). Increases in number of people on nearby trails also increases the potential for disturbance to bears. A small level of incidental take is expected from the increase in capacity for overnight use provided under the CG Plan.

Number of Developed Sites

As previously described in this biological opinion, the primary concern related to developed sites is direct mortality from human-bear conflicts, such as unsecured attractants (e.g., food and garbage), and resulting management removals. Secondary concerns include temporary or permanent habitat loss and displacement due to increased length of time of human use and increased human disturbance to surrounding areas. The Service anticipates that in a limited number of circumstances, existing developed sites within the recovery zone will result in management removal (direct mortality) due to conflicts at existing developed sites or surrounding areas.

Livestock Allotments

The Service anticipates take in the form of harm to grizzly bears as a consequence of livestock grazing and the associated livestock management operation in habitats commonly used by grizzly bears. The habitat modification of adding a significant, anthropogenic food source that results in the death or injury of bears can itself be considered “take” in the form of harm. The likely depredation of some of the permitted livestock represents an impairment of natural feeding that may in some cases ultimately lead to management removal or death of grizzly bears.

Measures of Incidental Take

According to Service regulations implementing the Act (50 C.F.R. § 402.14(i)(1)(i)) and as stated in the Endangered Species Consultation Handbook (Handbook; U.S. Fish and Wildlife Service, National Marine Fisheries Service, 1998), some detectable measure of effect should be provided, such as the relative occurrence of the species or a surrogate species in the local community, or amount of habitat used by the species, to serve as a measure for take. Take also may be expressed as a change in habitat characteristics affecting the species (Handbook, p 4-47

to 4-48). In instances where incidental take is difficult to quantify, the Service uses a surrogate measure of take.

Non-Denning Season Motorized Access

Full implementation of the Gallatin National Forest Travel Plan will provide the revised motorized access baseline conditions of secure habitat, OMARD, and TMARD for three subunits within the recovery zone that were considered in need of improvement over actual 1998 conditions (Madison #2, Gallatin #3, and Henry's Lake #2). Incidental take of grizzly bears is considered to be occurring in these subunits until they reach the new baseline conditions defined by full implementation of the travel plan. Therefore, the percent secure habitat below revised baseline amounts and the percent OMARD and TMARD above revised baseline levels provide our **first surrogate measure of incidental take**. Incidental take will no longer occur upon full implementation of the Gallatin National Forest Travel Plan when revised baseline conditions are achieved.

Within the recovery zone, percent secure habitat and percent OMARD and TMARD occurring in 1998 for 11 subunits and improved conditions over 1998 levels for three subunits (Tables III-5 and III-6) provide our **second surrogate measure of incidental take**. Incidental take would be exceeded if permanent roads result in a decrease in the amounts of secure habitat or increases in OMARD or TMARD from motorized access baseline levels defined in Tables III-5 and III-6.

Outside the recovery, we use the existing percent secure habitat within each BAU and the potential 1 percent below full travel plan implementation for secure habitat due to new permanent roads and 2 percent reduction in secure habitat below full travel plan implementation (Table III-7 in the BO) for combined new and temporary roads as our **third surrogate measure of incidental take**. Incidental take would be exceeded if secure habitat drops below 1 percent of full travel plan implementation for new permanent roads or 2 percent below full travel plan implementation for combined new and temporary.

Denning Season Motorized Access

During the denning season, we use the percentages of areas closed to over-snow motorized vehicles within the recovery zone as our **fourth surrogate measure of incidental take**. Incidental take would be exceeded if the area closed to over-snow motorized vehicles is decreased below established levels.

Increase in Capacity for Overnight Use

We use 350 additional campsites within the footprints of developed campgrounds inside the recovery zone as our **fifth surrogate measure of incidental take**. Incidental take would be exceeded if the total number of additional campsites incorporated into existing developed campgrounds inside the recovery zone exceeds 350.

Number of Developed Sites

We use the 1998 baseline number of developed sites on the CG Forest within the recovery zone (183; Table III-2) as the **sixth surrogate measure of incidental take**. Incidental take would be exceeded if more than 183 total developed sites occur on CG Forest land within BMU-subunits. This does not include developed sites allowed within the primary road buffer under *FW-STD-WLGB 04* and exceptions allowing modifications to dispersed recreation sites and temporary work camps under *FW-STD-WLGB 05*.

Livestock Allotments

We use the number and associated acreage of domestic livestock grazing allotments that existed inside the recovery zone in 1998 (Table III-8) as our **seventh surrogate measure of incidental take**. Incidental take would be exceeded if the number or acreage of active allotments within the recovery zone exceeds levels which existed in 1998.

III.B.1. Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species. The amount of incidental take described above is low. Much of the action area occurs outside of the recovery zone. As detailed in this opinion, and according to the 1993 recovery plan (U.S. Fish and Wildlife Service 1993), lands outside of the recovery zones are not considered biologically essential to recovery of the species. Further, considering the grizzly bear recovery strategies (U.S. Fish and Wildlife Service et al. 2013; U.S. Fish and Wildlife Service 1993) and the size, status, and distribution of the GYE grizzly bear population, incidental take of grizzly bears in the action area would not affect the recovery of the GYE grizzly bear population. The CG Plan implements several measures that would sufficiently minimize impacts to grizzly bears.

III.B.2. Reasonable and Prudent Measures; Terms and Conditions

Biological opinions provide reasonable and prudent measures that are expected to reduce the amount of incidental take. Reasonable and prudent measures are those measures necessary and appropriate to minimize incidental take resulting from proposed actions. Reasonable and prudent measures are nondiscretionary and must be implemented by the agency in order for the exemption in section 7(o)(2) to apply. The Service believes that the 2021 Custer Gallatin Forest Plan reduces the potential for and minimizes the effect of incidental take of grizzly bears. By managing for grizzly bears within the GYE recovery zone and zone 2 of the NCDE, the amount of incidental take of grizzly bears will be limited. It is critical to understand that the conclusion of this opinion is based on those features being implemented as part of the proposed action; if they are not implemented, our analysis may not remain valid, and this opinion may be subject to reinitiation (50 CFR 402.16(a)(3)).

The following reasonable and prudent measures are appropriate to further minimize the impacts of incidental take:

- A. Reduce the potential for displacement of grizzly bears related to motorized access.
- B. Reduce the potential for displacement of grizzly bears related to increased overnight developed sites.
- C. Minimize the potential for harm to grizzly bears from livestock grazing.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Forest must comply with the following terms and conditions that implement the reasonable and prudent measures described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary:

To implement Reasonable and Prudent Measure A:

1. Within the recovery zone, Forest management actions shall not reduce the percent of secure habitat in each bear management subunit below the 1998 baseline levels:
 - (a) For subunits identified in the 2007 Conservation Strategy as needing improvement above 1998 levels (Gallatin #3, Henrys Lake #2, and Madison #2), management actions shall not reduce the percent of secure habitat below levels attained from full implementation of the 2006 Gallatin National Forest Travel Management Plan.
 - (b) Management actions that result in temporary or permanent reduction of secure habitat below the applicable baseline are allowed so long as they follow the application rules listed in standards FW-STD-WLGB 02(a-e) and FW-STD-WLGB 03(a-c).
2. Within the GYE recovery zone, the CG Forest shall meet or improve 1998 baseline levels of OMARD greater than 1.0 mile/mile² and TMARD greater than 2.0 miles/mile².
3. When implementing management actions for the purpose of restricting motorized access within the grizzly bear action area (MHG, AB, BBC, and PR Geographic Areas), the CG Forest shall use devices or methods that ensure effective closure. Potential options include those recognized by the CG Forest (U.S. Forest Service 2009) or the IGBC (IGBC 2009) as effective closure devices and methods.
4. Within one year of signing the decision for the CG Plan, the CG Forest shall develop an improved monitoring program in conjunction with the Service that provides a method to monitor the effectiveness of all access restriction devices within the area the Service determines grizzly bear may be present on the CG Forest within every 4-year running period. If any access restriction devices or methods are found to be ineffective, the CG Forest shall attempt to remedy the situation (i.e., respond with an appropriate fix) as soon as practical within the same bear year, or no later than the following bear year.

To implement Reasonable and Prudent Measure B:

5. Changes to the capacity for overnight use shall be restricted to situations defined by *FW-STD-WLGB 04 (a-c)* and *FW-STD-WLGB 05 (a-d)*, and *AB-STD-OTO 01-03* of the CG Plan.

To implement Reasonable and Prudent Measure C:

6. To minimize potential attractants to grizzly bears and associated potential bear-human conflicts and management removals, the CG Forest will include a provision in all new and renewed livestock grazing permits requiring the permittee to notify the Forest within 24 hours of discovering a livestock carcass; notification will be followed by proper disposal or management of the carcass.

III.B.3. Reporting Requirements

To demonstrate that the CG Plan is adequately reducing the potential for and minimizing the effect of any incidental take that may result, the CG Forest shall complete a report with the information listed below and submit it to the Service's Montana Ecological Services Office biennially by May 1 for the preceding two calendar years for the life of the CG Plan. The report shall include:

1. Report additional capacity provided at developed campgrounds and commensurate elimination of dispersed campsites.
2. Provide any changes in number of developed sites.
3. The Forest shall submit responses to monitoring questions MON-WL-10 and MON-WL-11 as detailed in the planning rule monitoring items.
4. Provide changes in secure habitat, OMARD, and TMARD within the recovery zone.
5. Provide biennial estimates of secure habitat in BAUs outside the recovery zone and any changes due to addition of permanent or temporary roads.
6. The Forest shall notify the Service's Montana Field Office within 72 hours of notification of any livestock depredation, management removals, human-grizzly bear conflicts, or grizzly bear mortalities associated with defense of life.

III.B.4. Closing Statement

The Service is unable to precisely quantify the number of grizzly bears that will be incidentally taken as a result of the CG Plan. Therefore, we used five surrogate measures for the amount of take we anticipate. Reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. We have included reasonable and prudent measures along with terms and conditions in this incidental take statement, as well as reporting requirements that detail the progress of the action in order to monitor the impacts of incidental take. If, during the course of the action, the level of take occurring exceeds that anticipated in this incidental take statement, such incidental take represents new information requiring reinitiation of consultation and review of the incidental take statement. The federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

III.B.5. Conservation Recommendations

1. When planning projects, consider the importance of large blocks of secure habitat to grizzly bears. Design projects to minimize impacts to large, intact blocks, and look for opportunities to increase connectivity of secure habitat.

III.B.6. Reinitiation Notice

This concludes consultation on the effects of the CG Plan on grizzly bears. As provided in 50 C.F.R. § 402.16, reinitiation of consultation is required and shall be requested by the federal agency or by the Service where discretionary federal involvement or control over the action has been retained or is authorized by law and: (1) if the amount or extent of taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) if a new species is listed or critical habitat designated that may be affected by the identified action.

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